

MAY 1953

HUGO GERNSBACK, Editor

Science-Fiction **PLUS**

p r e v i e w o f t h e f u t u r e

•
*Complete
Short Novel*

By F. L. Wallace

•
*Plus
Science-Fiction
Stories by*

Eando Binder

Robert Bloch

Harry Walton

and others



35¢

Modern Space Suit

NEW NOVELETTE BY HARRY BATES, AUTHOR OF

THE DAY THE EARTH STOOD STILL

THE SCIENCE-FICTION INDUSTRY

... A new industry in the making ...

In 1926, I brought out the first science-fiction magazine. I never dreamed then that some day there might be a full-fledged science-fiction industry. Nevertheless, this came to pass, less than twenty-five years later.

While the extent of the infant industry is still modest, its volume will certainly extend a good deal beyond a turnover of twenty million dollars in 1953, in the U.S.

In the periodical field alone, there are now almost thirty science-fiction magazines. In the book branch, there were nearly a hundred new science-fiction titles this past year. All these activities are on the increase. Besides the hard-cover books, there are scores of specialized publications, such as pocket-books, quiz, and coloring books for the small fry. Such books sell for prices ranging from ten cents up to a dollar.

Next we come to radio and television, a particularly lusty and now booming science-fiction field. Programs of the "Space-Patrol" type are rapidly increasing. Here the young children are becoming thoroughly indoctrinated in the new endeavor. Moreover, these programs are excellent moneymakers for their sponsors. The next generation may therefore be counted upon to bring untold millions of new science-fiction fans into the constantly growing fold.

Add to the above the also increasing number of science-fiction newspaper strips and the Sunday-comics features, and it becomes difficult to see how the young and avid imagination can escape science-fiction conditioning.

Nor let us forget the coming torrent of scientific films. It would appear that the majority of science-fiction films made so far were successful. Their appetite whetted by good box office, motion picture producers are now entering the field in earnest. As this is written, we know of over ten new scientific films projected, or in the process of being filmed. We may look for a large and constantly increasing market in this branch.

Above we have considered only what may be termed as the "two dimensional" aspect of science-fiction: the printed word, radio and television, and the film. But in recent years, a new form has been added: *the third dimensional world of science-fiction.*

This new and wholly unsuspected development, undreamed of ten years ago, may well surpass, in physical volume and money value, the

entire two-dimensional field in the near future.

These new three-dimensional forms of science-fiction which are now beginning to swamp our stores consist of toys, games, gadgets, scientific instruments of all kinds, wearing apparel for youngsters, and countless other constantly evolving, ingenious devices.

Space helmets of every description, space-suits, space guns, space shooting ranges, Space Cadet modelcraft, space viewer picture guns, "Buck Rogers Sonic Ray Gun," "Official Space Patrol Watch," "Space Patrol Monorail Train," "Meteor Express" (imported), dozens of space rockets and space ships—these are only a small part of the large catalog of this type of merchandise now to be found in thousands of stores.

Remember, this is only a modest beginning. Most of the science-fiction merchandise now offered is geared for the small-fry market; consequently the pricing is modest.

So far, little has been produced for the youngsters from ten years upward. This easily may become the most lucrative three-dimensional market. It may be defined as the more serious "Scientific Instruction" branch of the industry. Boys, particularly, of this age are not so much interested in mere toys; they want something better. The early radio amateur and construction boom from 1910 to 1925 amply proves this.

We may therefore soon see a similar boom in all sorts of scientific instruction merchandise. To name but a few: Knockdown astronomical telescopes, mass produced, for easy home assembling. Reasonably priced (\$25 and up) scale models (for home assembling) of the solar system, with the planets in actual verisimilitude motion. Space rockets with all the necessary parts for assembling and which actually can ascend (by compressed air). Scale models of space ships, complete with all interior instrumentation, rocket motors, air tanks, navigation machinery, even miniature scale planetariums are coming.

The list is practically endless. Moreover, no parent who can afford it will be likely to refuse to buy such purely educational equipment for his children. He knows it is certain to pay real dividends for them when they grow up.

In our present-day scientific world, the science-fiction industry will certainly play an impressive rôle in the future. It may well take its place among our *larger* industries soon.

Science-Fiction^{PLUS}

preview of the future

HUGO GERNSBACK
Editor & Publisher

SAM MOSKOWITZ
Managing Editor

M. HARVEY GERNSBACK
Executive Editor

ELIZABETH MENZEL
Editorial Assistant

H. WINFIELD SECOR
Science News Editor

CHARLES A. PHELPS
Consulting Editor

FRANK R. PAUL
Art Director

CONSULTANTS

GUSTAV ALBRECHT, Ph.D.
Physics, Taft College

JOHN R. PIERCE, Ph.D.
Electronics Engineer

MAY, 1953

Vol. I, No. 3

FEATURE NOVELETTE

DEATH OF A SENSITIVE by Harry Bates 4

COMPLETE SHORT NOVEL

WORLDS IN BALANCE by F. L. Wallace 39

SHORT STORIES

THE COSMIC BLINKER by Eando Binder 20

THE PROXY HEAD by Robert Bloch 26

INTELLIGENCE TEST by Harry Walton 32

COVER ARTICLE

FUTURE SPACE SUITS by Donald H. Menzel, Ph.D. 19

RISCIENCE

THE ELECTRONIC BABY by Grego Banshuck 59

NEXT MONTH

MURRAY LEINSTER

One of science-fiction's most outstanding writers, makes his first appearance in our pages, with a fascinating and colorful long novelette of human problems in an alien environment, which, while complete in itself, is technically the sequel to his two famous stories, *The Mad Planet* and *Red Dust*.

The Next Hundred Years of Atomics

a fascinating, profusely illustrated, future history of the atomic age, containing a wealth of scientific speculation and prediction.

by HUGO GERNSBACK

FRANK BELKNAP LONG, will return with a beautiful, almost poetic story of a man stranded on a world of a distant star.

HARRY WALTON, has a short one, with a real sock ending, that would be spoiled by advance blurbing.

Our next cover will be a superb astronomical of the planet Saturn, from a unique angle, painted by Alex Schomburg.

In addition to many other fine stories, articles, columns and illustrations.

Next issue on sale May 8.

FEATURES

The Science-Fiction Industry (Editorial)	by Hugo Gernsback	2
Stranger Than Science-Fiction		18
Science Quiz		24
Chain Reaction		25
The Back Cover		61
Science News Shorts	by H. Winfield Secor	62
Book Reviews	by Sam Moskowitz	66
Science Questions and Answers		66
The World at Bay	by Forrest J. Ackerman	67

Front Cover: by Frank R. Paul
Back Cover: by Frank R. Paul and Tina
Interiors: by Frank R. Paul, Jay Landau, Tom O'Reilly, Charles Hornstein, Muneef Alwan and Seymour Augenbroun.
Lettering: by Muneef Alwan
Layout Consultant: Sol Ehrlich



This design, symbolizing science-fiction, is displayed with all stories of a serious scientific-technical trend. Such stories contain new ideas certain to be realized in the future.

\$100.00

will be paid by this magazine for each Short-Short Science-Fiction Story printed in future issues. These stories must be real science-fiction, not fantasy, and should not run over 1000 words. The Short-Shorts will occupy one page of the magazine.

SCIENCE-FICTION - Published monthly by Gernsback Publications, Inc., at Erie Ave. P.O. Box 6, Philadelphia 22, Pa. Vol. I, No. 3, May, 1953. Second class entry pending at the Post Office at Philadelphia, Pa., under the act of March 3, 1879. Single copies 35c.
SUBSCRIPTION RATES: In U. S. and Canada, in U. S. Possessions, Mexico, South and Central American countries, \$4.00 for one year. All other foreign countries \$5.00 a year.
EXECUTIVE AND EDITORIAL OFFICES: 25 West Broadway, New York 7, N. Y. Telephone BR 6-8630. Gernsback Publications, Inc., Hugo Gernsback, President; M. Harvey Gernsback, Vice-President; G. Alliquo, Secretary.
FOREIGN AGENTS: Great Britain: Atlas Publishing and Distributing Co., Ltd., London E.C. 4. Australia: McOll's Agency, Melbourne. France: Drentano's, Paris 2e. Holland: Telepress, Rotterdam. Greece: International Book & News Agency, Athens. So. Africa: Central News Agency, Ltd., Johannesburg; Capetown; Durban. Natal, Universal Book Agency, Johannesburg. Middle East: Sternitzky Middle East Agency, Jerusalem. India: Broadway News Centre, Dadar, Bombay #14. K. L. Kannappa Mudalliar, Madras 2. Pakistan: Paradise Book Shop, Karachi 3. Entire contents copyright 1953 by Gernsback Publications, Inc.
While the utmost care will be taken in their handling, no responsibility can be accepted for unsolicited manuscripts. These should at all times be accompanied by a stamped, self-addressed envelope.

Death of a

CAUTION. Discard any mental patterns you may have formed of what you think this science-fiction story is like or how it is written. Don't expect anything remotely similar to the science-fiction you are accustomed to reading. This story is a sport. A science-fiction story so unique, so different in plot and approach that it is destined to become one of the most discussed ones ever written. You will either like it very much or dislike it intensely. Either way, it offers uncontested evidence that SCIENCE-FICTION+ has policies elastic enough to accommodate any science-fiction story that is truly exceptional and different. This is but the seventh yarn that Harry Bates has published under his name. Bates has never written a poor story, and both he and the editors feel that this is without doubt his very best.

by HARRY BATES

(Illustrations by Jay Lunden)

Mr. Bates was a pioneer science-fiction editor, following Hugo Gernsback by editing a magazine for Clayton Publications in 1930. For that publication he wrote the famous *Hawk Corso* series under the pen name of Anthony Gilmore. Among the famous stories under his own name were *Alas, All Thinking*, *A Matter of Size*, and *Farewell to the Master*, the last of which was used as the basis of the picture, *The Day the Earth Stood Still*.



I BRING YOU A MOST urgent message.

The man who charged me to deliver it is dead. He died to transmit it to you.

I have just come from him. I was with him when he passed away.

I want you to ignore the confusion in the streets. Pay no attention to the invaders! Read this to the end. There I shall give the message.

I cannot give you the message until I have described all that happened. For you would not feel compelled.

There is confusion here in the city room as I start. It churns all about me, it rises from the street, it comes in over the phones and the wire.

I think there is one of the Creatures on the roof. Not far from here the body of John Inglis sits upright in a big armchair. At last the great sensitive is at peace. I know he is at peace. His wonderful head lies bent over on his breast. His face is dead white, and there is a small hole in his wrist.

It is John Inglis who transmits the message.

I feel that he is guiding me now (this you will come to understand). I feel I can remember every word that was spoken.

(Interruption. A copy boy has just snatched from my hand the first page of copy, the first "take," and has run with it straight to the composing room. I had hoped for that. Since this story is bypassing the copy desk—and is not therefore to be edited—I shall not write it in the usual newspaper style, but shall tell it as a consecutive narrative.)

I must be fast!

Several hours ago this was a normal world.

I had just turned in a story, and the city editor handed me a phone memo. The superintendent of the building where John Inglis lived had phoned in, saying we might be interested to hear that the sensitive had gone "off his trolley," as he put it. He had an apartment full of cockroaches. He was acting like a friend of the cockroaches. There were strange doings. He himself was very curious. Above the memo in the handwriting of the city editor were the words: "Warren. I think you know this man. Feature?"

Everybody of course knows the name Inglis, and will remember how, ten years ago, the identical twin brothers, John and Robert, astounded the world with their feats in parapsychology. But the name Inglis meant something special to me. I was at Columbia at the same time they were piling up their records there, and I even shared some of their classes. They were the start of my own layman's interest in parapsychology.

It looked like a good assignment. I went to the newspaper's morgue to bring myself up to date. The clerk handed me a number of envelopes stuffed with clippings. At least once each year, in the ten years which have elapsed since their college performances, the Inglis brothers have been the subject of feature stories in this newspaper. One of these features, which appeared last year, was my own, so I already knew the background. All the stories, including mine, were rehashes of their great performances at Columbia as volunteer subjects of the famous parapsychologist Dr. S. T. Whitman. They lived apart. They had always lived lives of seclusion and bleak poverty. The recurrent question of the features was: Why didn't they ever amount to something? Why, with such powers, did they remain so inconspicuous and poor? Specifically and vulgarly, Why didn't they "clean up" on the races, or the stock market, and take a prominent place in the world?

I spent little time with the clippings, but went and picked up a photographer. I was assigned Willie. That is *not* his name. Willie is something of a louse. I don't approve of his methods. Naturally, he doesn't like me. But he is considered one of the best pic-men in the business.

Willie is a desiccated little gum-chewer, and a wise guy. As we drove off in my car I tried to warn him to behave.

"This man Inglis is a great sensitive and a mighty nice guy," I informed him. "I had a feature on him last year. This time I've a peculiar tip—something about cockroaches. It sounds like a good story and some swell pictures. Now, Willie, I want you to show him some manners. Lay off him till I'm through. Try

"I am faint," he said suddenly. —>

Sensitive



to be decent for once. Don't try to catch him in an awkward moment; don't take any candid shots at all. Get his approval on everything. And don't try to force him into any vulgar poses. Get it?"

He was chewing gum, of course. Now he kept on chewing and said nothing.

I said strongly, "You hear?"

"You get your story and don't try and tell me my business," he said, calloused, totally impervious.

"Well, I've told you your business," I came back, a little ugly. "Do you know what a sensitive is?"

"Do you?" he answered. Of course he is not very bright.

"A sensitive is a man who has powers not explainable by known physical laws," I told him—for I doubted very much if he knew, and he'd never admit he didn't know something. "He can perform feats of clairvoyance—that is, see things that exist or are happening at a distance. Or can foretell events which will occur in the future. Or can be the means of psychokinesis. In psychokinesis objects actually are moved without the use of known forces."

He kept chewing away. I thought I knew what he would be thinking. I went on:

"They don't hold your hand in a dim room and tell you fortune, and they don't accept money. They do these things under controlled conditions, in front of scientists—yes, and sometimes in front of magicians, brought there to guard against possible trickery."

"They're all a bunch of phonies," he announced with contemptuous finality, hardly missing a chew.

"The scientists who work with them don't think so," I answered.

"I never heard of one cleaning up on the races," he said, enormously complacent. "I could have smacked him."

"That's right, they don't clean up on the races," I answered. "For one reason they don't try to."

He grinned, and stuck a cigarette in his face and lit it. Thereafter he both chewed and smoked.

"For another reason," I went on, "they usually miss. Even the best of them hit only a fraction of the time, so that their success has to be evaluated statistically. It's that way with John Inglis. He, however, is in a class by himself. He and his brother Robert."

He chewed and puffed. There was simply no way to get to him. I shut up.

I pulled up at the address on the memo—the same place of a year ago. It is an old-fashioned tenement house which has survived alone, lost among two irregular rows of warehouses near the end of a half-deserted street over by the East River. Many of its windows were broken or boarded up. The entrance was a cracked and dirty marble doorway in the center of the ground floor. Galvanized garbage barrels stood in stinking rows on either side of it.

We entered. The hallway was long and very dark. At the far end was a decrepit door, its windows painted black. Through a break in the corner of one pane came a trace of dim light from a court in back. To Inglis' door was tacked a small piece of cardboard containing his name, neatly printed by hand.

"Remember your manners," I warned Willie, and then knocked.

There was no answer.

I knocked louder, and there was still no answer. I was still waiting, thinking someone would come, when Willie turned and began kicking the door with his heel. He kicked much too hard. At the noise a man stuck his head out of the apartment door just behind us across the hall.

"I'm the super," he whispered, holding one finger to his lips. He beckoned us into his glaringly oil-clothed kitchen. "You're the reporters?" he asked. "It was me sent for you."

"Isn't he home?" I asked.

"Yeah, he's home; he never goes out," the man answered.

"What's this about the cockroaches?" I asked.

"Well, that's the thing," he answered. "I don't rightly know what it is, but something's going on. There's a little girl lives in the house who goes errands for him and yesterday she left the door open and I saw inside. Inglis is always neat as a pin, but I saw there's a lot of cockroaches on his kitchen floor, most of them dead but some of them alive. But that ain't what I mean. He's laid boards over the floor, a little bit off, so he can walk on the boards and not step on the cockroaches. He just walks on the boards. I think he's gone off his trolley."

"How long has he had these boards?"

"I don't know. They weren't there a week ago."

"Does he talk crazy?"

"No. Just the same as always. He don't never say much. Just goes around quiet, his head a little on one side like he's thinkin'. He's always thinkin'."

"Why doesn't he come to the door? He certainly heard us. Is there any way we can tell if he's in?"

"He's in, all right. Come, I'll show you."

Again touching his finger to his lips he led us down the hall to the door at the end and pulled it open. The blank brick wall of a building in back seemed almost to hit me in the face, it was so close. It was so dark there that it would have been hard to read a newspaper.

The shades of the back of Inglis' apartment were pulled all the way down.

There was a narrow concrete walk or alley, walled on the far side by another brick building, which led back along the side of the house parallel with the central hallway within. The super tiptoed around to the first window opening on this alley and put his face at the pane.

The shade there, too, was drawn all the way down, but it was torn, so that there was a small hole through which he could see the interior. He peeped through this hole, then turned to me and nodded a yes, and then I too peeped in. John Inglis, the man I remembered, was there. The room was lighted, and I could see his shoulder and the right side of his head. He was sitting quietly in a large armchair. At first I thought he was asleep, but when I was about to turn away I saw his head move a little.

I gave way to Willie and he put his eye at the hole. It seemed almost at once there was a click, and Willie had his first picture. I gave him a look but said nothing, for that shot certainly didn't have any value.

"He's in there and he's awake," I said to the super. "Why doesn't he answer our knock?"

The man shrugged. "Sometimes he don't like to be bothered," he said.

We went back to the hall entrance and knocked again, very loudly. Even then Inglis did not come to the door, nor did we hear any sound. I began to wonder.

Willie turned the knob. The door was locked. He took something out of his pocket and applied it to the crack of the door near the lock. I couldn't see it, but I knew from office gossip that it was a very thin flat piece of flexible steel. Then he pushed. The door opened inward and he stepped inside. It was an improper thing to do, but, hardly thinking, I fol-

lowed him inside, the super following close at my heels.

It was completely dark. Willie produced a small pencil flash and swept the room with its narrow beam. We were in a rather large kitchen, the reverse in layout of the one across the hall. The beam cut to the floor and fingered around.

The super was right. Two board walkways ran the length of the kitchen near the opposite walls, and connecting them at intervals lay several cross-walks. The walks were old planks, lifted four or five inches from the floor. The planks rested on wooden blocks set in tin plates filled with water. Here and there on the floor the thin beam of the flash picked out a cockroach or two, sometimes moving, usually dead.

Willie found a pull chain and jerked on the light. The door leading into the rest of the apartment was closed, and I tiptoed toward it along one of the walks. As I went I heard a click. Willie had taken a second picture. I turned toward him in anger, and it was at that moment, behind and unseen by me, that John Inglis opened the closed door and entered the room.

THE GREAT SENSITIVE stopped inside the door and stood motionless, looking right at me. I felt terribly embarrassed at being caught that way in his place, and he saw it. With the faintest of smiles he said to me:

"That's all right."

I blurted out something about having knocked several times and wondering what was wrong.

"That's all right; I wanted you to come," he said kindly, in his quiet voice.

My friends—all you who read this—John Inglis was a hell of a good guy.

He remained standing there, looking at one, then another.

I suppose all the world has seen his picture, but I had better describe him. He was 31 years old, a man of medium height, a little wide and thick. The thickness was not muscle, it was fat. Evenly, all over, he carried a thin layer of fat. The man never got any exercise.

Anyone seeing him for the first time would likely notice only his head. It was a striking head—large and broad, with hair a mass of coarse black ringlets. His complexion was milky white. He did not have the thin-skinned esthetic face usually associated with sensitiveness. Quite the contrary: his face was full, the underlying bones large and strong; his skin looked rather thick, and no lines showed in it except around the eyes. But for his head and his eyes, and the relaxed way he stood there, he might have been taken for a truck driver. He was indeed wearing a truck driver's zippered jacket, now unfastened.

His wonderful eyes showed him as one apart. They were blue; even in the glaring yellow light they showed their blueness; but whether they were light or dark I cannot tell you, for they seemed to change color as he moved them, and they seemed to change with his words as he spoke. I think he might almost have conducted a conversation with those eyes. The whites, this time, were quite bloodshot, but even that did not seem to spoil their effect.

No doubt his gaze embarrassed the super too, for that man said, stupidly:

"The door was unlocked so we just pushed in."

"The door was not unlocked; but that is all right," came the quiet voice. "I hope you stayed on

the planks," he added, looking at Willie, who had one foot on a plank and the other on the floor. Slowly, contemptuously, I thought, Willie brought the other foot up. Inglis turned back to me.

"Sometime early this morning I remember thinking it would be a good thing to ask you to come, Mr. Warren," he said. (He remembered my name!) "I suppose I practically invited you—through our friend the superintendent." At this the super's eyebrows went up. Inglis smiled slightly. "But I only want to see Mr. Warren," he went on, looking at Willie, "and it may take some time; so I suggest you go back and save your time. I'm sorry," he said, dismissing the other two.

He turned and led the way past the inner door. I followed him through the next room, which was his bedroom, into the rearmost room, the one in which we had seen him through the window. Arrived there we found that Willie had come to. We looked at him.

"This must be private," Inglis said evenly.

Willie's eyes narrowed.

"Look, I'm the photographer," he said. "You can't say anything to him that you can't say to me."

"Out," I ordered. "And no more pix."

He sneered at me. I approached him and suddenly grabbed his camera. He made a jump toward me, stopped, cursed, and then, after thinking things over a moment, turned and left. Inglis followed him to the kitchen door, closed it after him, and put a chair under the knob. Then he came back and asked me to be seated, he himself taking the large armchair he had sat in before. He sighed.

"That man disturbs me dreadfully," he said in his quiet voice. He closed his eyes, and for a second the wrinkles deepened about them. I got down to business at once.

"I know how you feel about these interviews," I said, "but I think I can make this brief and relatively painless. We have all the ancient history at the office. If you will just bring me up to date—tell me what you've been doing this last year—and then—well—tell me why you've got all those planks on the floor."

He said nothing.

"Why do you have them?" I asked directly.

"Are you afraid of stepping on the cockroaches?"

"That's right," he said after a moment. "I don't want to kill them."

"Why?" I asked.

"I don't know," he answered, his eyes still closed.

"Most people are only too glad to kill them," I went on, feeling my way. "I don't remember seeing any the last time I was here."

He opened his eyes, and I thought I saw signs of distress in them.

"It is quite recent," he said. "They started coming a week ago. The people upstairs are doing something which drives them down. I think they are poisoning them. A nerve poison. At any rate they come down here to me, and then they die."

"Well?" I asked after a moment. Again I saw the distress in his eyes. I said, "But you don't remove them."

"I know. But some are still alive. They run, and they'd be crippled," he said.

"Is it so awful to kill a cockroach?" I asked.

All my questions seemed to cause feelings of distress in him. He moved his head slowly and said:

"I really don't know how to answer you. The planks seemed like a good idea."

"Better than to kill them and sweep them up?"

"It—just—seemed—appropriate."

There was no doubt at all that I was somehow torturing him. To lighten the moment I said, smiling, "It does look odd."

"I am aware of that," he said, smiling faintly himself.

"You have no planks here, or in the bedroom."

"They rarely come in here. When they do I carefully shoot them back to the kitchen."

He offered nothing further, but sat studying me. I saw that he had something heavy on his mind and was trying to decide about opening up. As I waited and wondered, I had an intuition. I asked:

"Mr. Inglis, does this compulsion about the killing—about the planks—does it seem to be associated with your paranormal powers?"

"Yes," he answered, looking me straight in the eyes.

"Is it a message?" I asked him.

"I think it is."

"For you?"

"I don't know."

For a moment I did not know what to say. Then I asked:

"It doesn't come clear?"

"That's just it," he cried, showing a trace of excitement, "It doesn't come clear."

"How long has this been going on?"

"A week," he answered. "But early last evening there was something new." He rose. "Come with me to the kitchen," he said, beckoning, and led the way back. I followed him, carefully keeping on the planks.

The light was still on, showing unpleasantly several scores of cockroaches along the edges of the floor and lower walls, most of them dead, but some moving. He pointed to a patch of white on the floor at a place just in front of the old-fashioned kitchen cabinet.

"That's flour," he said. "I spilled it preparing dinner last night. Later, when I went to clean it up, I found something."

He stepped to the patch and carefully got down on his knees in front of it, moving carefully to avoid a live cockroach. Extremely curious and equally carefully I let myself down by his side.

Near one edge of the whited area lay a large cockroach, dead. Backward from it lay the trail it had made in its passage from the other side. The trail twisted and doubled; it looked like writing. Suddenly I saw that it *was* writing. Four words lay spelled out there in a wandering schoolboy hand, certain as can be! They read, "do not kill us." The last "s" was not quite finished, and the writer lay on its back, its legs folded symmetrically inward, stopped by death at the point where the twisting trail ended.

Chills ran down my back. I stared at the words.

"The poor little devil," Inglis murmured. "It came in poisoned like the others. It died in pain like the others. But in dying it had a task."

"A message," I breathed.

"A message," he said. "'Do not kill us,'"

"It's psychokinesis!"

He nodded. He said, "This happened yesterday—but I already had stopped killing them for a week."

"Because you felt it 'appropriate' not to kill them?"

"Because I felt it appropriate."

I was frightened. The air around me seemed charged with unknown potential. Somewhere in space-time—somehow—an intelligence could conceive this—will this—possessed the undetectable force to effect this. For no one has ever credibly explained psychokinesis. It happens. It has even been produced in the laboratory. From some place unknown, from some thing or condition unknown, comes a force which can move a material object. The nature of the force cannot be detected. Its presence cannot be detected, except insofar as the object moves. It is not gravity, not electricity, not magnetism. It may move either inanimate objects or living matter. If in seances there is genuine contact with the dead—which is far from proved—it is likely that it is by psychokinesis that the vocal chords of the mediums are manipulated in the production of the authentic-seeming voices of the dead ones who "speak."

"This is the rarest of paranormal phenomena!"

I exclaimed, awed by what I was looking at.

"Who knows?" Inglis said thoughtfully. "It may be the commonest of the normal."

The implications of his words hit me suddenly, and like a ton of bricks. Again the chills ran down my back.

"Did you effect this?"

"Not that I know of," was his answer.

"It was some entity, or force, or something, working independent of you? Or were you in some sense the medium by means of which it happened?"

"I don't know. But I feel I am involved in it somehow."

"This cockroach has come—been sent—been made to actually write out the message to which you have already been responding for a week," I said.

He sighed, and the tortured look again came to his eyes.

"I can't catch it—I just can't catch it," he said.

"I feel no particular urge not to kill cockroaches. It just began to seem appropriate not to kill them. There was no emotion involved. That is the common experience in receiving paranormal intelligence—though there are exceptions, sometimes striking exceptions."

"I just saw a cockroach or two and felt it appropriate not to kill them, and then I took steps not to kill them. I don't think I felt any particular emotion about the cockroaches as such. . . . Now this.



"... it was writing."

This is direct and specific. Yet even this message does not cause in me any emotion specific to cockroaches. . . . There are theories and good men and even whole religions devoted to the ideal of not taking life, not even the life of the simplest creatures . . . and I have sometimes toyed with the thought . . . but I have always sheered away from such mysticism. As things are set up in Nature, life lives on life, animal and plant, right down to the single cell. . . . As a sane person, and one of good will, I have merely killed as little as is consistent with the maintenance of my own status as a live animal. Germs I kill; insects, except pests, no. I eat meat. Of course I am inconsistent," he added, darkly contemplative; "but I don't worry much about that. It is a problem that can't be solved."

He sighed, then wearily got to his feet and led the way back to his living room, where he again slumped tiredly in his chair. I followed, greatly disturbed. I wanted to help him.

"Someone, or something, is sending you a message," I began. "Or more accurately, you keep receiving a message but you don't understand what it means."

"It is probably only part of a message," he said, wearily. "'Don't kill the cockroaches' doesn't make sense."

He closed his eyes and let his head rest on the back of the chair.

"I'm all in," he said. "I am oppressed by the feeling that I am failing in a matter of great urgency. To be fruitful one must be relaxed; but I can't relax. How can one relax after a week without sleep? I try to sense—which is wrong—and sometimes I feel I am close; but it won't come; it just won't come. I am at the end, Warren. I can't go on this way any longer."

I felt terribly sorry for him. I ventured:

"Are there other conditions for optimum reception, and are you complying with them?"

"Best conditions usually are merely to be quiet, to be alone, and to be relaxed; but not always. I've been under great strain lately, but I've had evidence of great sensitivity, more perhaps than ever in the past. But it's not been enough."

He opened his eyes; then, looking vaguely in my direction, he said:

"I am bringing it to an end. I am going to commit suicide."

I was astounded. He was quite serious. His words were spoken with quiet firmness. For the first time it struck me that he might be mentally disturbed—I mean irrational—but this thought quickly passed from my mind.

I could not at once find anything adequate to say, but only stared at him, in distress myself. This man was no neurotic show-off, but a highly mature, decent, intelligent but terribly bedeviled person. I had no doubt that he was at the end of his endurance.

"You're talking very foolishly," I said finally. "You're tortured; you need help. I'm going to call your brother. He can help you. Where's your phone?"

"I haven't any phone," Inglis said. He was extremely depressed.

"Then I'll send for him," I stood up.

"I haven't any brother," he said.

I didn't understand. Inglis sat without moving a muscle, except that I think he smiled faintly. At last he explained.

"My brother is dead."

I was shocked, then incredulous.

"But he's not dead!" I cried. "He can't be dead! That would be a big story, and no word on such a thing has reached our office!"

"He died last night," Inglis said quietly, still without moving.

"How do you know?" I asked. "You were there?"

"I saw him," he said, and to me he seemed to be seeing him again in his mind's eye. "He came to me. At a little after three this morning. I was sitting in this chair, and at the moment of his death he came to me."

For a moment I was speechless. That was one more paranormal phenomenon—not uncommon—known through the centuries. What unthinkable psychic forces were permeating this helpless man!

Suddenly a frightening suspicion flashed through my mind.

"Did he take his own life?" I asked.

"I feel he did."

"You don't know for sure?"

"No, but I feel he did. . . . He, like me, has been suffering. He was bearing the same burden."

"Did he give you a message? How did he look? Tell me, for heaven's sake, man!"

"He was dressed as usual. He wore a jacket much like mine. . . . I had been meditating. I looked up and there he was, just inside the door. He was solid and real. He took several steps toward me, then stopped and raised his right forearm. There was a gash in his wrist, and his wrist and hand were splashed with blood. In his left hand was a sheet of paper. He held out the paper—his lips moved—but I heard no words. My God, I could hear no words! . . . There was an expression of great suffering on his face. For a second or two he held out the paper; then his face softened and became most beautiful . . . and then he dissolved and was gone. . . ."

How I felt as I sat and heard these things! I wanted to help Inglis, but I was way out of my depth! Inglis was such a good guy! Somehow I had to rescue him! But how? I sat there paralyzed. Who has ever been in a situation like that!

But my mind did keep working, it seems, for I produced another thought. Eagerly I broached it.

"This Dr. Whitman for whom you and your brother were subjects in school—he's a good friend of yours, isn't he?"

"He was."

"Aren't you still friends?"

"Yes, in a way. I haven't seen him for several years, but that was my doing, not his. I have come to be something of a recluse; I seldom go out."

"All right," I began eagerly—but he interrupted me.

"I know. You want to go fetch him. Perhaps he will be able to help me."

"Yes!" I exclaimed. "There's no one in the world knows you better. He has worked with you, he knows your powers—of course he can help you!"

"I had thought of him," Inglis said. "We used to get some wonderful results together."

"You'll get some more!" I cried, quite excited. "Inglis, it's ridiculous—it's all wrong for you to sit there and talk about taking your life! You need help; he can give it to you—positively. I'm going to get him."

"Fred Warren," he said, looking straight into my eyes, "I have the feeling that several hours from now I'll be sitting in this chair dead, like my brother, and I will be with my brother. Wherever and whatever he now is. That I feel. I don't particularly want it, in a sense. I just feel it. I—I feel it is appropriate."

"You have very often been wrong," I retorted. I was standing. "Inglis," I said, "I'm going to fetch him. You've got to give him a chance to try to help



"It looked like . . . chromosomes . . ."

you. Will you promise not to do anything until I return with him? I will take your word."

For a moment he did not answer, but looked thoughtfully through me, as it seemed; then he turned his head. He said:

"I had thought of asking him to come, but I felt, and still feel, it would be useless." He smiled slightly. "You notice how I keep saying 'I feel'? I usually *feel* nothing at all in the paranormal process, but when I do my feeling usually indicates a hit." He took thought, and I waited. "If he could only help me to dissolve the feeling of 'appropriateness' . . ." he murmured, thinking out loud. "It wouldn't hurt any . . . and he'll be an extra witness. . . ." He turned back to me with an enigmatic expression. "You know, Mr. Warren, I wanted you here to witness my death. You have the three things needful: knowledge of parapsychology, competence as a reporter, and resonance with me as a man. It may be my death will give you something to write about. I don't want to put it into words, but perhaps you will sense what I mean. But it might be better with both of you. . . . Yes, get Dr. Whitman. I'm very fond of him. I give you my promise. And while you are gone I shall prepare my body."

I choked down my objection to his last words. I asked:

"May I go to your brother's place? What if he's alive! And aren't you curious about the paper he was holding out to you?"

"He is dead," he replied. "I feel it will do no good. But you may go if you want to."

I asked him the address and he told me. He took a small bunch of keys from his pocket and held them out. "This is my set of his keys," he said.

I took them and rushed out with the feeling I held his life in my hands.

I HAD FORGOTTEN ALL about Willie; I saw him in the hall and hurried past without a word. As I entered the car I found him right behind me, and he took a place in the front seat at my side. He kept his mouth shut. He was much too sore and egotistical to ask any questions, but he was not going to miss anything if he could help it.

A few minutes later I was at Robert's house. It was a somewhat better building. His box told that he lived on the second floor, also in the back. The keys let us in without delay. I saw more cockroaches. Robert was there. He was dead. . . . I can hardly bear to write this! He sat in a comfortable armchair much like his brother's, his head low over his breast, his face drained white. On a low table by his right side lay a white enameled basin. His right forearm lay tied to the chair arm so that the hand lay out over its top. There was a gash in his wrist, and the basin was half full. . . .

I kept thinking I was looking at John. . . .

In Robert's left hand was a sheet of paper, just as his brother had described. I took it. On it were some marks. It looked like a drawing or a small piece of chaotic writing—very roughly like chromosomes during the process of cell division. It was meaningless to me. I stuck it in my pocket.

I can't remember exactly the shameful thing that happened then, but I know Willie made a grab for his camera, and I avoided his hand and hit him, and he stood there with his teeth bared, hate in his eyes. And I hated him too, fiercely. But when I left he was close behind me, and he rode up to Columbia right by my side, neither of us speaking a word, only hating and hating. . . .

I knew the campus like a book and without hesitation drove over the forbidden drives straight to the Parapsychology Building. By the time I was in the vestibule Willie again was fastened to me. The students must have thought us mad. I am sure I looked wild; I know I was soaked with perspiration. I took the stairs three at a time and in a moment was at the door of a certain lecture room well remembered from the old days. Without hesitation I pushed through, Willie still at my heels—and there, on the lecture platform, thank God, sat old Dr. Whitman. Twenty or thirty pairs of eyes turned to look at us as I hurried up to the little table behind which the parapsychologist was sitting.

In the lowest voice I could muster I blurted out that I had come on a matter literally of life and death—the life of John Inglis—and the angry look that had come to his face dissolved instantly. He would have pulled me into his office, but when I whispered that I would explain in the ear he dismissed the class at once and came hurrying along with me just as he was. I had never seen Dr. Whitman on the campus with his head uncovered, but he didn't take time to pick up his hat.

I got Willie into the back seat of the car, and as I made the curved passage to the gates I began pouring out my story in bits and pieces. The good doctor was appalled. Again and again as we drove back through the streets he stopped my rush of words and made me repeat and amplify and make clearer. I told him about everything: the cockroaches, the walkways, the four written words, Robert's death appearance, the firm bent toward suicide, and finally the morbid scene that met my eyes in Robert's apartment.

I showed him the paper. To him, too, the marks were meaningless.

"The man is tortured!" I kept telling him. "He can't sleep! He has that message, and we can't tell what it means, or even if it's complete. It's worse than labor. You must believe him! He thinks only death will give him relief! He hopes that at the moment of death his message will come clear!"

Toward the end of the drive back Dr. Whitman was exerting himself to calm me.

WHEN WE ARRIVED the street was very quiet; the few trucks lay motionless at the curbs or stood at right angles, backed up to their loading platforms. There were hardly any people about; most of the trucking activity there occurred at night. We entered the house. I knocked on the door and at once escorted Dr. Whitman inside. I pointed without speaking to the walkways and the cockroaches, then I led the way back to the living room.

Inglis met us at the door. He had changed his shirt, and I think he had shaved. The two friends shook hands with affection. Inglis invited us to be seated, and himself sat down in his big chair.

Dr. Whitman sat on the edge of his chair and leaned tensely forward.

"What's all this Mr. Warren has been telling me?" he asked. "You talk about suicide? You shall do nothing of the kind, I am your friend. I probably am your best friend. I have worked intimately with you, and I know a good deal about you. Together we shall work this thing out. You are tortured? There is a devil in your skull? We shall exorcise it."

Perhaps the good doctor's words and manner would have reassured many people, but here he was meeting a different order of experience. Inglis sighed deeply and looked away. He said:

"There is something I've got to know but can't catch. It's of greatest urgency. It's heavy. It permeates my body, it fills all the air around me, it weights me and it devils me. I smother!"

"We shall deliver you," Dr. Whitman said resolutely. "First, let's try some word associations. Attend! I shall speak some single words. I want you to tell me the thoughts and feelings you associate with them. You know the process. Answer quickly. All right, are you ready?"

But Inglis was looking at Willie. He was standing at the door; I had forgotten all about him. Inglis said: "I shall have to ask that man to go outside."

Willie stood there and glared at him.

"Please go," Inglis said. "You disturb me very much."

Willie didn't move, but he spoke. "You're off your nut!" he said hatefully.

It was shameful. "Get out!" I told him. "I'll call you if I want you."

He turned with his hate toward me for a moment, cursed, I think, under his breath, then left the room. We heard the hall door bang.

"That man is not clean," Inglis said.

"He's gone. Forget him," said Dr. Whitman. "All right, John, the first word. Insect."

Inglis did not respond. For a moment he sat looking vaguely up toward the ceiling; then he got to his feet, picked up a book lying on a coffee table nearby, and turned to the side window and placed it upright against the shade over the tear. I had just time to see through it a small motion.

Inglis then returned to his chair and sat leaning forward, his face clasped in his hands.

I said, "I apologize for bringing that man here. But he's considered a good news photographer. He always gets his pictures, and the public eats them up. He's very good at posing a stricken mother weeping over a dead child in a gutter. He never fails to get the blood in, and the baby, if there is one. He is ignorant, stupid, competitive, and heartless, and a complete egoist; he knows only one thing: get the picture. Remember, you excluded him, and I took away his camera. I think you can understand his feelings."

"I understand," said Inglis. "Each one has his flaw. God be merciful to us, animals that we are. . . ."

He was very low for a while, and it took time to arouse him, but Dr. Whitman's considerate attentions at last brought him to the point where the exploration could begin.

"There will be no more distractions," he said. "John, your associations. The first word, Cream."

"Milk," was the response.

"Book."

"Words."

"Brown."

Inglis smiled a little. "The eyes of the little girl who lives upstairs. She goes my errands. Sometimes she comes in just to visit me. She sings coming down the stairs. Always she sings! She doesn't sing well, but she's not aware of that. She's still so little aware; she sings! She's a darling . . . and she twists my heart!"

He was deeply affected. We waited for him to recover. Dr. Whitman gave the next word.

"Insect."

"Cockroach."

"Legs."

"Cockroach."

"Animal."

Inglis writhed as if tortured. After a moment he said, "Cockroach."

"Creature."

"No, no, you mustn't do this to me!" he cried. "I can't stand it!" His head moved from side to side, and he breathed heavily. As we watched him I knew that Dr. Whitman was probing his own mind, trying to understand.

I myself was tortured. I felt something frightening in that little room. It was in the air; it tingled me. For some time no one spoke. We recovered somewhat, and then I heard Dr. Whitman speaking again.

"Mr. Warren told me about the four words, John. Will you show them to me?"

Inglis led us out to the kitchen. "Be careful where you step," he said. He took a flashlight from somewhere and we stooped about the patch of spilled flour, while he held the light beam on it.

There lay the dead cockroach at the end of its torturous, torturous path. There lay the words. "Do not kill us," the little messenger had said, and so saying died. I heard Dr. Whitman gasp. The weird sensations of just before began to return to me, and my heart beat violently.

The psychologist turned his head and asked gently:

"What do you associate this with, John?"

"I can't give an answer. It's confused. It's terribly confused. It's a torture."

"Do you feel that this is somehow associated with you?"

"Oh, yes!"

We continued to kneel about the patch, looking, each thinking his own thoughts, feeling his own emotions. Dr. Whitman murmured, "This could have happened by chance only once out of—a pageful of digits."

As we were looking at the words a large male cockroach appeared at one edge of the flour patch, near the wall. It started to cross the patch. It was sick. It had been poisoned. It rocked. Sometimes slowly, sometimes rapidly it moved, leaving behind a perfect record of its tortured trail. It passed just underneath the letters of the four words, and at the end it stopped and turned.

I watched it, breathless. It stood there listing a little to one side, obviously in distress. It kept stretching upward to maximum height, then lowering almost to the floor—up, down, up, down. Its antennae waved. I could feel its distress almost as if I were in its place.

But then it began to move forward again. It went crazily as before, sometimes running, sometimes at a crawl; but sometimes now it stopped altogether and only made its tortured up and down movement. It was listing much more. It reached the side it had originally entered. It had retraced its path under the words, keeping just underneath the first trail!

"My God!" Dr. Whitman murmured.

"It's underlined the words!" I exclaimed.

But it wasn't finished. It turned again. It started back for a third passage. It was extremely deranged now, and moved rapidly with wide-convulsive jerks. It proceeded just beneath the second trail. When it was a little more than halfway across it came to a stop. Its up and down movements now were terrible and it was listing extremely. Suddenly it fell over on its back. Its legs waved wildly for a moment, then fell motionless, then folded neatly and symmetrically over its abdomen. It did not move again.

Even now my heart beats so I can hardly write this. I was scared! I am sure we all were. There was something frightening in the air. It was all around us. I could not know if it was malevolent, but there was something present! Something that was active!

Inglis sobbed, got to his feet and went back to the living room, and we followed. Without a word each of us again took his seat.

"Do not kill us," murmured Dr. Whitman. "That is the message. It must be the entire message. It was underlined, not added to. Three times it was underlined."

"I can't stand this any longer!" cried Inglis.

"Well, you're not going to take your life," said Dr. Whitman sharply. "There's been progress. We know we have the message. We've only to find out what it means."

"I can't stand any more," repeated Inglis. "Go away. Please go away! Let me handle this myself!"

"And take your life?" asked the doctor.

"I have to!" said Inglis.

"So do crazy men and cowards feel they have to."

"It's more than you know," said Inglis. "I now foresee my sitting here dead. I will be dead by my own hand within two hours. I have no wish for it to be otherwise. I have the strongest feeling that it is appropriate."

This stopped Dr. Whitman. I ventured to enlighten him.

"I think I know the meaning he attaches to the word 'appropriate.' Correct me if I'm wrong, Mr. Inglis. It's a feeling that there has been a successful intuition. He feels it 'appropriate' not to kill the cockroaches. He felt it 'appropriate' to lay down the planks. To him the word expresses his awareness of a strong but indefinite compulsion or wish reaching him from the psychic ocean. He thinks that obedience to the compulsions is vital to the message."

Dr. Whitman reacted strongly against this idea.

"It's never 'appropriate' for a healthy man of

sound mind to destroy himself," he said dogmatically. "He's exhausted. He's plagued by a morbid fancy, nothing more. When he gets some sleep it will be gone."

Inglis watched the doctor as he spoke, and smiled sadly. I watched him too, but I did not smile. I was sure he himself did not believe what he had said. I saw him bite his lip.

"I didn't speak honestly," he admitted. "I do think it is more than a fancy."

Inglis looked fondly at his old master.

"Warren put it very well," he said. "Do you remember how, in our work together, I usually had no idea whether my tries were successful or not? There was no feeling of success when I hit. Only the figures later would show by how much I had exceeded the expectations of chance. You may recall that I told you it was that way even in that terrific series of 93 right calls of the die." He turned to me. "There were six sides on the die. Dr. Whitman rolled it in a hotel room in Philadelphia—though I didn't know where he was. I was in the lab at Columbia. I called the number he rolled 93 consecutive times, then quit without a miss." He turned back to the psychologist. "But I hadn't the slightest feeling of correctness about a single one of those hits. This of course is the usual thing."

"But"—his voice rose—"there were times in our work when I was sure. Sometimes I had a feeling about my call. When you and the others asked what that feeling was like, I would only say it was a feeling of rightness all through my body. The right call satisfied something in me; it seemed to be 'appropriate.' I doubt if I ever used the word in those days, but it describes the feeling I have had this week. To stop killing cockroaches seemed 'appropriate.' Note that the feeling was finally confirmed by the written message; yes, and by the underlinings you yourself witnessed."

Inglis roused and seemed to gather his forces. He continued strongly:

"Now hear this, Doctor. As fond as I am of you, and as much as I respect you professionally, and in spite of all you may say or do, I tell you I feel it is appropriate that I let the blood from my veins; and I shall act on that feeling. I shall do it and I know you won't stop me, for I also know that within two hours I shall be sitting in this chair dead."

Inglis turned his head and looked across the room. His eyes fixed on a large plastic basin of the type used frequently for bathing babies. It was the same type of basin I had seen beneath the wrist of that other Inglis, even then sitting dead and alone in his room.

"No!" cried Dr. Whitman, and he rose to his feet.

"Yes," said the afflicted man firmly, returning his eyes to the other's face.

As the two looked at each other the tension was broken by a sound at the hall door. We heard the door open, followed by the light patter of running feet coming in our direction. A little girl of perhaps five years came dashing in and almost threw herself at Inglis where he sat in the chair. She had hardly touched him before she twisted her limber body and stood erect between his knees taking us in. Wide-eyed, with opened mouth, quite unselfconscious, she stood and wondered at us.

"This is my little friend," said Inglis softly, touching her straying hair and shifting position a little so as to look better into her clear brown eyes. But she paid no attention to him and just kept on wondering at us. "We are learning arithmetic," he said.



"Both hands were working..."

At these words she became self-conscious; an impish smile spread over her face and she started to squirm. I think she must have been made of rubber, she bent so. At the end she was hanging backward in a sharp bow over Inglis' left knee, her hair dangling almost to the floor.

"How much are two and two?" Inglis asked her. She squirmed even in that position; then suddenly she straightened up, ran to the door and turned.

"Nine!" she cried triumphantly—and scampered back through the bedroom and away. We listened to her footsteps as long as they could be heard.

"How she sings!" Inglis murmured. "What is her great secret?"

"Her secret is that she's a happy child, and your secret is that you need a few kids of your own," said the psychologist. "Well, you'll have them yet," he promised grimly. "Now look here, John—look—wake up!"

Slowly Inglis turned his eyes to him.

"Tell me, have you tried automatic writing?"

The effect of this was surprising.

"No, and I'm not going to!" he answered with much emotion.

"We're going to try it right now," the doctor said firmly.

"No! Please! I can't stand that! It tears me apart!"

"Good," the doctor retorted. "It may let out your devil."

DR. WHITMAN WENT to Inglis, pulled him to his feet and urged him toward a small table in front of some bookshelves. Earnestly protesting, the sensitive let himself be seated at it. The psychologist set before him a pad of paper which he found lying on the bookshelves and stuck his own pencil into his hand. Inglis kept protesting, but the other was inexorable.

"This may solve all your troubles," he said firmly, "but you've got to be co-operative. Please stop this childishness."

Inglis quieted. He sat with the pad before him, the pencil just off its surface. "Don't look at your hand," said the psychologist.

Inglis turned his head so that he was looking at

as over his right shoulder. His hand remained motionless. We waited, but nothing happened. Dr. Whitman took out his handkerchief and threw it over the hand and pencil.

At once the hand began to move. It moved rapidly in large motions. When it came to the edge of the paper it moved back to the left and started another line. But Inglis never took his eyes from our faces. We were standing at his side, all but touching him. There was a look of anguish on his face; his eyes seemed to drain me with a deep unworded appeal. He began to breathe heavily, and sometimes made small gasps.

The hand moved faster. The handkerchief fell off to the side, but the hand kept up its rapid motion.

When the hand had written half a dozen lines and the paper was three-quarters full, there occurred a thing more extraordinary even than this. While the right hand continued to write, and with hardly a pause in its motion, Inglis's other hand darted to the pad, tore away the bottom half, reached into a pocket of his jacket and itself began to write on its own half of the pad. Both hands were working, the right rapidly, the left slowly—while the eyes of the man connected to the hands were turned from their work and remained fastened on Dr. Whitman's, only a foot away. Inglis was panting now, his face was contorted in anguish, he gasped loudly and almost rhythmically. But the end was at hand. When the right hand reached the bottom of the paper Inglis wrenched out a groan, threw both pencils at the wall, pushed away from the table and backed to the door of the bedroom. He stopped there, trembling, an indescribable expression on his face.

"I'm split!" he cried.

Dr. Whitman snatched up the papers and looked at them. Over his shoulder I looked too.

The words written by the right hand were indecipherable. What was on the other paper caused my hair to rise. It was a drawing, or ideograph, or group of marks like those on the paper I had found in the hand of the dead Robert! Dr. Whitman took from his pocket Robert's paper and compared the two. Yes, they were very much alike. Both looked something like a drawing of chromosomes in a cell. It was meaningless.

Inglis watched from the doorway with haunted eyes.

Dr. Whitman stepped across the room to a small wall mirror and held the page written by the right hand so that its edge lay along the surface. I saw at once this was mirror writing. Words appeared, run together, still almost illegible; but gradually we were able to understand most of it. Inglis approached us to look upon the unconscious work of his hand, but the parapsychologist ordered him away.

These were the written words. Where something could not be deciphered I place a question mark.

brown eyes in great distress (?) shameful in the (?) (cumulative?) effects of nosiness
nosiness nosiness god save the mark the
animals the poor poor things as if to be
different is to be inferior I tell you it police
is coming with another camera (?)

When I had read the last words I at once ran back through the apartment to the hall door. Willie wasn't there. He wasn't outside, either, and my car was gone. I returned with the news to the living room.

"The photographer's gone, and so is my car!" I told Dr. Whitman. "He may very well be going to get another camera."

"And here's this word 'police,'" the psychologist

added thoughtfully. "Well, it's of no importance," he concluded.

He studied the phrases, taking his time, now and then making a little nervous click with his tongue. Then he re-examined the left hand's paper, again comparing it with the paper I had found in the lifeless hand of Robert. John Inglis said:

"That's the paper my brother held in his hand when he came to me."

He was pointing to it. He had not yet been permitted to see it. He asked, "Are they alike?"

"Yes," answered Dr. Whitman. "What's written on them?" he asked. He watched Inglis keenly.

"I don't know," came the hesitant answer.

"Your reactions?"

"I don't know. . . . It's confused. It's emotion. It's distressing." After a moment he added, "It's very important."

We all looked at each other, baffled. We sat down as we were before. As for myself, I needed to sit down. The constant tension was exhausting me.

Dr. Whitman studied the page of writing and prepared to proceed.

"I want your associations with these phrases, John," he said. "I'll read them one by one. All right, 'brown eyes in great distress,'" he read.

"I think of the little girl," Inglis replied. "She has brown eyes, but I associate nothing about her with distress."

Dr. Whitman turned this over in his mind, then went on:

"'shameful in the.'"

"Nothing special."

"'cumulative (I think that's what it is); cumulative effects of noisiness noisiness.'"

"Nothing special. Of course I detest noise, and, as you know, I've had to endure a good deal of noisiness."

"You know how these things are, John," the doctor interjected. "If we can find one significant thing in this small sample, just one, we'll be extremely lucky. . . . 'god save the mark.'"

"Nothing. That's an old-time exclamation, I believe. I'm sure I myself have never used it. I've never even thought it, that I can remember."

"'the animals.'"

"That upsets me," Inglis said. "It's all emotion. It's a kind of anxiety."

I could tell that from his face, without hearing his words. Dr. Whitman went on:

"'the poor poor things.'"

"Nothing much. Doesn't sound as if I could have written that. I don't talk or think that way."

"'as if to be different is to be inferior.'"

"Yes!" the sensitive exclaimed.

Dr. Whitman leaned forward eagerly. "What is there about that?" he asked.

Inglis seemed to feel for words. "I don't know," he said. "I can't describe it. The words disturb me very much. It is not exactly unpleasant."

"How would you explain your writing those words?"

"I—I—I was about to say they seem appropriate, but I don't want to say that exactly. . . . I don't know. . . . As a concept, that has been in my mind ever since I can remember. It seems to tie in with my behavior toward the cockroaches. Who is this 'superior' man, that he should feel justified in taking the life of anything! Even the life of a cockroach! If to be a Negro is to be inferior, then to be a white man is to be superior; but this also works in reverse. If to be small and brown and have six legs and lurk in

cracks is to be superior, then man is inferior to the cockroach. Is man really superior to the cockroach? That depends on the 'if,' and the 'if' depends on whether it's the man or the cockroach who sets the standard. There are no 'ifs' in natural laws."

We turned this over in our minds; then, since Inglis volunteered nothing more, Dr. Whitman continued. He said, "I'll read all the rest in one piece, for it seems to have one group of thoughts except for an interruption. I tell you it police is coming back with another camera."

"Obviously that is simple clairvoyance or telepathy, if it's true," Inglis said promptly. "Mr. Warren took away the photographer's camera and now he is coming back with another. It may or may not be so, I have no feeling about it. And he could be bringing the police. He's very angry, and he thinks I'm crazy."

I THOUGHT I DETECTED in Dr. Whitman a feeling of disappointment. He sat in thought a moment, then suddenly handed Inglis the two papers with similar marks—the one made by his brother and the one made by his own left hand.

Inglis reacted strongly. A surge passed through his body; he held his breath, then released it and breathed more rapidly. His eyes made quick wide movements, and his lips parted.

"This is the key!" he exclaimed.

"What are your associations?"

"I can't tell you! It's obscure, though very strong. All mixed up. It's all emotion. . . ."

He stumped and seemed to be listening. The psychologist asked:

"Look at the marks. If you had to describe them to someone, how would you do it?"

"I'd say they look like drawings of chromosomes in cells. Fat, curly worms. Each a little different. Two sets, the left and right halves of each set symmetrically disposed."

"What are your associations with the word 'chromosome'?"

"Life. Persistence. Heredity. Mystery."

"Your feelings?"

"Mild. Pleasant."

"Are they feelings of appropriateness?"

"No."

"Look at the marks again. Both you and Robert made those sets of 'fat, curly worms,' as you describe them. Do you have any feeling that your drawing them was what you call 'appropriate'?"

"Yes!" Inglis pushed violently to his feet. "Please don't do this to me!" he cried. "You keep torturing me! You split me!"

Gently, Dr. Whitman coaxed him back to his chair.

"Let's sum up," he said. "We know some important things. We know the message: it is the one written and underscored by the cockroaches. 'Do not kill us.' Your reaction to the words 'animal' and 'creature' was symptomatic—especially the word 'creature.' The word 'cockroach,' however much you have been concerned with cockroaches lately, does not affect you at all. You were powerfully affected by the words, 'as if to be different is to be inferior.' You even gave us a little lecture. And now these two drawings, or whatever they are—no reaction to the word or concept 'chromosome,' but a marked reaction to the drawings of the fat, curly worms themselves, and a strong feeling that they are significant. There can be

no doubt: the key lies in the nexus: drawings—animals—creatures—inferiority."

He thought a moment. "Have you ever seen an animal, or creature, that looks like the drawings?"

"No!" Inglis shouted.

"Why do you say 'No' with so much emotion?"

"Because I feel it!—and you know that very well! You musn't do this to me, Dr. Whitman! I tell you, you split me!"

Dr. Whitman sighed and sank back in his chair.

"Are you stuck?" Inglis asked.

"Yes," was the admission. "For the time. . . . Well, there's only one thing to do. You've suffered far too much, John. You've got to sleep. I am going to take you home with me and give you an injection. Tomorrow, or the next day, when you're refreshed, we'll tackle this again."

The afflicted man shook his head.

"I have told you," he said; "I have told you again and again: I feel it is appropriate that I die. That too is symptomatic."

"But symptomatic perhaps only of exhaustion."

Inglis regarded his old master firmly.

"I allowed Mr. Warren to fetch you chiefly for one reason. That was the thought that it was only reasonable to afford you a chance to remove the feeling of 'appropriateness' I have toward my death—if you could. I expected you to fail. You have failed. But since you came my feeling of necessity has been confirmed. I now know—I *know*—that shortly I will be sitting dead in this chair. I have seen myself so. I feel that it will be so. I feel that it is appropriate that it be so. Furthermore, I feel that there is a limitation of time. You cannot counter these intuitions, Dr. Whitman. You cannot controvert my powers. I am being controlled, and you cannot controvert the controls."

"You think that at the moment of death there may be a clear revelation?"

"I will not put into words what I think."

"Isn't that being superstitious?"

"I don't know," he said, at bay.

"It is important to you personally that you destroy yourself?"

"I don't know. It might be important for others."

"Of course it *might*. And you would be dead."

"I feel it appropriate."

"Don't speak that word to me! I'm sure it is a trap!"

"Everything could be a trap."

The parapsychologist shook his head with compassion.

"You are exhausted, John. You should see your eyes! Can you think I trust your feelings?"

"My powers this last week have been tremendous."

Dr. Whitman rose. "Inglis," he said determinedly, "you are coming with me."

"I am not," said the other.

The doctor turned to me.

"Will you help me?"

I said, "Do you think it likely that the two of us could handle him? Even if we could, would it do any good? A man really bent on suicide can't be prevented."

This balked him. Once more he turned to Inglis and besought him with utmost earnestness to come and be given the means to sleep. Gently but inexorably Inglis shook his head.

The psychologist studied the sensitive for a moment. "Sit down, John," he begged. Slowly the afflicted man complied. Dr. Whitman turned something over

in his mind for a moment, then he began talking to him, quietly, soothingly.

"You are tired, John; you are very tired. I know. A week and no sleep? You show it. Have you seen your eyes? Have you ever seen such bloodshot eyes before? Well, I'm going to make one more attempt to help you. I think I can help you to lose some of your tension. I know I can. It should not be difficult; you are so tired. You may not realize it, but you are extremely sleepy. If you should want to close your eyes for a moment, go right ahead. I see it would not be hard for you to fall asleep."

"I am so tired," murmured Inglis. "To sleep—just think!—to sleep, then wake up with all my troubles gone!"

I SAW THE PSYCHOLOGIST with opened mouth seeking a chance to interrupt, but Inglis ignored this and continued himself to speak. "I should think you must be tired too, my old friend." The doctor raised an arm, but Inglis would not let him break in. "You *should* be tired," he went on, never pausing. "You're not as young as you were. You've experienced great excitements here. Let us all try and relax for a little. While we do I'll tell you something. I assure you you'll be interested. But sit quietly; you too, Mr. Warren. I never could talk to people who sit tense—especially those who are itching to interrupt. We've all been terribly overstrained, haven't we! Do you know the technique of relaxing? There is a technique; not many people know it. The routine is simple. I am going to tell you."

His voice had picked up; his manner was actually compelling. I think I was surprised. I watched him with much interest; he was charming; he was actually magnetic. I'd never have dreamed he could be so magnetic. He went on:

"First you relax the muscles of your right hand. Like this. Do it with me. So. Limp, utterly limp. So you can't feel anything. Not a thing. Let your thumb fall outward if it wants to. That's it. Now the left hand. Relax it. Do it, Dr. Whitman. More. More. No feeling. There is no feeling at all. Now your arms. Both arms. Attend first to the right, then to the left. Alternate. Relax. Droop. Right, left, right, left. Do it, Dr. Whitman. That's it. Now the same with your legs. Start at the toes. No tension. Relax. Let them sleep. Now your calves. One, then the other. Let them feel heavy. They do feel heavy, don't they?"

More and more command was coming into his voice. He never ceased speaking, and kept looking straight into his old master's eyes, with side glances into mine. I couldn't keep my eyes from his eyes. He kept using his hands, pointing with them, relaxing them, drooping them, demonstrating; I saw every motion they made—but my focus was on his compelling eyes. I *did* feel relaxed . . . more and more relaxed.

"Heavy legs," he was saying. "Heavy arms. Heavy eyelids, too. If you want to close your eyelids, just do so. Close them . . . soothingly . . . close them." I closed my eyes. I couldn't keep them open. "Soothingly close your eyes. That's right. Pretend I am your father. Yes, I am your father. You must obey your father. You are so sleepy. Sleep. Sleep. You are both so sleepy. Your father tells you to sleep. Sleep. Sleep more deeply. So."

A new sharp tone came to his voice. "You are asleep! You are sound asleep! You obey your father. You love your father and want to please him. If I should ask you to lift your left arm and your left leg

you would do it, wouldn't you. Of course you would. I am going to ask you." Sharply he commanded, "Both of you, lift your left arm and your left leg!" I obeyed. "Good. Open your eyes." I opened my eyes. I saw that Dr. Whitman like me had raised his left arm and left leg. "Lower your arms and legs." We lowered them. "You are both sound asleep," he went on, "even though your eyes are open. You will remain sound asleep. I am going to perform an experiment, a little inconsequential experiment, a simple readjustment of space-time and matter. I too am going to sleep. I shall sleep very deeply. When you see me sound asleep you will wake up. You will stay asleep until you see me sound asleep, and then you will wake up. And then you will remember everything that happened while you were asleep. You will do this, won't you. Answer me!"

"Yes," we said.

He got to his feet, went and picked up the basin and placed it on the coffee table, then placed the table along the left arm of his chair. From his pocket he took a length of cord and a penknife. He opened a blade of his knife and set it on his knees. He bound his left forearm to the arm of the chair so that his wrist hung out over the edge. He bent back his hand. He placed the point of the knife blade near the turn of the wrist. He hesitated.

I saw his body firm. He jabbed.

THE BLOOD ARCHED out in a solid stream. After a few seconds the flow lessened and became a steady thick red cord. He watched it for a moment, then turned his head to the right and looked at us with an expression I cannot describe but will never forget.

"This is such a poor way to take leave of you!" he cried; "but I had no choice! You were trying to hypnotize me, Dr. Whitman! I had to beat you to it!"

His eyes turned back to the steady red cord, then returned to us.

"When I am sound asleep and quite motionless you will wake up," he said firmly. "Both of you will wake up. When I remain motionless you will wake up. You will remember every word that I speak. Later you will describe every little thing that I say and do. Do you understand? Answer."

"Yes," we said.

A faint smile came to his face.

"I really have something interesting to tell you. It's a confession, Dr. Whitman. There was a period when you used to hypnotize me, do you remember?"

"Yes," was the answer.

"You were testing my powers under hypnosis, for one thing. Well, I played a trick on you one time. I hypnotized you! You had started to hypnotize me, but I hypnotized you. It was a prank and I shouldn't have done it, and I was fearful afterward lest you know that I did it, or find out that I did it; but you never did. I hypnotized you, and you never knew it! Of course I gave you the appropriate post-hypnotic suggestion. . . . How unthinkable intermixed are the threads of our fates! Because once, long ago, I pulled a prank, I remembered it in my extremity and was confident I could do it again. Toward you, Mr. Warren I felt the same confidence for another reason. You are clean, and I've liked you. I've seen you sensitive and sympathetic. I knew you would respond to me."

He turned his head and watched for a moment the cord of blood arcing slightly from his wrist. It was thinner now. He smiled, ever so faintly. "I think I feel a little weak," he said.

Time passed. He brooded. Suddenly he cried,

"Oh, how I wish I could talk normally with you! I know it could be done, but I don't dare try. I have been lucky enough. . . . Answer me, Dr. Whitman. Search your mind and answer truly. Did you ever suspect that I hypnotized you?"

"No," was the reply; "but there was one session at which I couldn't account for my time."

The man who was dying smiled a little. After a moment he turned to me.

"Did you find my brother like—this?" he asked.

"Yes," I said.

"Which arm did he use?"

"The other one. The right."

"We were mirror-image twins," Inglis said. "We are," he corrected. For a moment he was silent; then he announced quietly, "Now I am really weaker. . . . Well, I shall soon be with him, wherever or whoever or whatever he now is. . . . I have had a tremendous piece of luck in my life: I was one of identical twins. You who are of single birth are half missing. For the identical other is not a separate person; he is the other half of yourself. Day by day and side by side you grow, living extrapolations of all the million matrices of that first single potent pregnant cell; but your sum is always one. Everything the other does, you do; every experience you have, he shares. He is always there to play with, to associate with; what he thinks, you think, and what you feel he responds to in phase. Your pleasures, problems, friends, worlds, are alike. And to one person, at least, you are always important. You live together *en rapport*."

"But how much extra so this was with Robert and me, with our paranormal powers! Even when apart, consonance was continuous!"

"We continued to deviate from the normal throughout life. By the nature of angles, as children we were not deviated far; but as we grew older our psychic peculiarity made us increasingly two freaks and misfits; but ours was the same deviation; we were alike; John plus Robert equaled one. That fine thing we had."

"Our paranormal powers were a tremendous burden. We were sensitive, but much too sensitive. The normal person lives within a shell which gives a measure of protection from the disharmonic waves of the psychic Mother Ocean; we seemed to lack that shell. We could be bruised by a look, wounded by a thought; we could be lifted and tossed and battered and half-drowned in the great swells and riptides of animal emotion from the great submerged herd. With increasing divergence we more and more sought quiet and seclusion. For years it was gladly we lived; but now, I assure you, I am not sorry to die. . . . When I say 'I,' I say 'we.'"

Inglis brooded. Now his hand hung limp, and the inexorable red cord depended from the lithe fingers. He watched it. From time to time it broke, to instantly re-form with a little sound—*pip*. He said:

"Wonderfully, the body is mobilizing to defend its integrity. It will fail. Two quarts of my life are gone. . . . I am very much weaker. . . . I feel at peace now, my dear old master. Can't you be glad for me? Peace for the first time—the first time in such a long time. Is peace an effect of weakness? Oh, definitions! I'm sure that half the troubles of the race of men are semantic ones!"

"I wish we could really talk. . . ."

"It is so peaceful and lovely. Just think, there are people who can feel this way once a week. For a week I was in torture, and now, with letting of a little blood, I am at peace. What was my torture of the past week? I almost forget. There was a message. I thought I was

intercepting, or being sent, a message. Confident, I brought you here, to witness the great Change. But I sink slowly into peace, while you remain behind with a new distress. Forgive me! I had thought there might be a message; it seemed so important; but I only subside. . . .

"I shall be with Robert soon. Wherever and whoever and whatever he now is. The Change is coming, and I shall know. . . . The great Change. . . . I have killed many insects; I have seen a hundred cockroaches die; they came to know, and now I shall know. Life: they had it: I still for a moment have it. What is the difference between a cockroach and a man? I know there is one or so, but I no longer can see such little things. We both live, and then we die. Are there separate hereafter for cockroach and man? How can it be thought so! Where in the series does a man start being something special, to rate a special hereafter? Has the cockroach a soul? No. An ape? No. A man-ape? No. An ape-man? Maybe. But a man, yes! Oh human vanity, what quibbling! Experts in the unknowable are agreed that at some arcane point between cockroach and man there appeared a new, tremendously valuable ticket—something entitling the accredited bearer to a reserved seat in human heaven; apes and cockroaches not admitted. I don't want to go to such a place. . . ."

Inglis' head had for some time been lowering. Now it was low indeed; but from his words he did not appear to be aware how weak he had become. He was pausing not only between sentences, now, but sometimes between phrases. More often the red cord was breaking and re-forming with the little *pip*. I could not see how much of Inglis' life was in the basin, but he seemed far from unconsciousness. His head was lowered, but his eyes were open and still held forward.

"I am faint," he said suddenly. ". . . There was to have been a message. I did think so . . . or was it only a hope?"

THERE WAS A SILENCE. He seemed to rouse a little. His voice now was quite low, and the pauses longer.

"It is inconceivable. A man dies unexpectedly in London, and at the moment of death he appears to his wife in New York. *Rapport* in life, communication at death. . . . My brother, only a few blocks away. . . . What force is this? How could I state where those artifacts were, buried twelve thousand years, entombed in a wilderness under twenty feet of earth? But they dug, and they found them, and they were as I had said. I did not vision them, I did not feel anything about them. I just said it; it seemed appropriate. . . . That man in Melbourne . . . amnesia . . . a fugue . . . he didn't himself know who he was, but I spoke his name and around the world they found him. How is this? . . . I have lived in an ocean of consciousness. Or is it an ocean of awareness? No more definitions. It is an ocean of awareness—shimmering, pulsing with intelligence, ineluctably interwoven, eons thick. Look upon the unthinkable distances between the universes. What lies beyond? The astronomers say there are a billion Earths, each teeming with its various life. Here we have cockroaches and human beings and apes and bacteria; but what are the creatures of the other Earths? They live. Our experts seem unaware of this and haven't got around to denying them a hereafter; but they are there—different, bizarre, alive. So very very many of them will be life forms superior to ours. . . .

"Life forms—what does that mean? Life. . . . It may be that living creatures never will know what life is; but motion is part of it. Is the virus alive? Will it go to virus heaven when it is no longer a whole? There are not so very many atoms in a virus molecule. They are the same atoms that cooperate to erect an elephant. Their electrons whirl, and all thy piety and all thy wit will not avail to stop them half a second. Eternally the electrons go about their atomic business; I am sure they are alive, momentarily alive, until they meet their opposite charge and themselves experience the great Change. I am not thinking absurdly, my dear friends; it's just that I have nothing to speak with but words. Words. We are all choked with words. . . ."

"But I can come close to the truth. There is an infinite and everlasting ocean of Something. In one manifestation matter appears, and universes rush away. So radiantly! Out of the radiant energy more matter appears and takes its place, and the ultimate universes themselves dissolve back into energy, or are manifested as energy, while the cosmic ocean heaves and shimmers. Yesterday and tomorrow, today and the light fading from my eyes and the blood out of my veins are one, variously manifesting, clotting and unclotting, seeming to speed and seeming to stand still. It is a One with aspects that our eyes see as changes; differences and changes; and somewhere in it, the ultimate miracle, there lies the possibility of love and kindness. Yes, the atom contains the capacity to be kind. Better, the atom in one aspect is kind. . . ."

He stopped speaking, but his voice, edged with hoarseness from his speaking, still seemed to echo through the room. Now only drops were falling. Only their *pip* could be heard.

For a long time the silence held, but Inglis was still alive. His eyes remained open except for brief intervals, and his head kept lowering, and he kept bringing it back a little. I felt that he had spoken his last words.

Slowly I watched him weaken. His eyes remained closed for longer periods, his head dropped still lower, and remained low longer.

But suddenly he spoke again. Head down, eyes closed, he said:

"Forgive me."

The silence returned, and went on. Occasionally, very infrequently now, there was the *pip* of a falling drop. Ever so faintly I heard the noises of the great city around us: an attenuated clatter, the vibration from a passing truck, the faint tear of a jet plane far in the sky. We sat unmoving; sat, I think, unable to move. And time passed. And the dripping ceased.

At some point I noticed that Inglis had raised his head. Just the least bit. And his eyes were open. Slowly his head continued to raise a little more, and as it did his eyes fixed on a point low on the opposite wall. As his head raised the eye focus shortened, until he seemed to be looking at something at a place in the air only a few feet in front of him, a little off the floor. My flesh crept.

Inglis' bloodshot eyes watched that place as if it were the only thing in the universe. Back and forth between his eyes and that vacant place my own eyes traveled, while unknown forces crackled and prickled through my every cell. Inglis roused greatly. He turned to us and cried in triumph, "You see?"

I saw nothing.

Again his eyes were back on that vacant place. Again he turned to us and cried, "Do you hear?"

But I heard nothing.

"It's the message!—clear at last!" he cried. "They've come! They're in the streets! They're not



"The men were poking the Creature with sticks!"

unfriendly! They're different, but not inferior! Be kind! Do not kill them! Do not kill them!"

These were the last words. He panted; for a moment his eyes held on the vacant place near the floor; then slowly his head dropped to his breast, lower and lower, while his eyes moved upward, still holding on that vacant place, and holding there until the end.

His eyes did not close. He sat there, chin on his chest. For a long time I watched him, and then I got to my feet and bent low over him, close, so close to that wonderful tortured head. Dr. Whitman was there by my side.

I closed his eyes.

Dr. Whitman said, "With blood I could pull him back. Given five minutes I could still save his body, but his mind would be gone. . . ."

I stood there resonating on a higher plane of awareness. And then I heard a click behind me. I turned. Willie was there. He was holding a camera. He had entered and taken a picture.

I hit him. I hit him hard. I took the camera and smashed it against the wall. I ran out to the street. My car was there, and near it a police car, but both were enclosed in an excited shoving crowd of truckmen. I jumped into my car, started the engine and inched forward. Reluctantly the excited men made way. I streaked through the dusk for the office.

The Creatures had come! I'd seen one! It had fat, curly barbels! I saw it through the legs of the men! The men were poking the Creature with sticks!

I poured my story into the city editor's ears. He sat in the midst of chaos. He could hardly have understood my words, but he understood my emotion and waved me to my desk.

Now I have written it. *Here is the message! Hear it, everybody—hear it! The Creatures have come! They're not unfriendly! They are different, but not inferior! Restrain yourselves! Be kind! Do not kill them! Do not kill them! Do not kill them!* +

STRANGER THAN SCIENCE- FICTION

INCREDIBLE as it sounds, young boys have repeatedly given birth to infants. Medical science cites a number of instances of this strange phenomenon, called *teratoma* (monster). The infant is in reality the boy's twin brother. Due to a freak of nature, the original sperm cell instead of developing normally

as a separate entity—becomes lodged in the brother's abdominal cavity. When the boy grows to puberty, the twin embryo begins to grow. The boy's abdomen enlarges just as

Pregnant Boys

in normal pregnancy. An operation must be performed to save his life. The twin-infant is usually imperfect, may have no legs or arms, or head. The monster is usually born dead.

There is no record of a girl giving birth under similar circumstances.

An excellent specimen of this abnormality was dissected and is preserved in the Hunterian Museum.



Up In Smoke?

A FRESH Havana cigar may weigh one ounce. If it is completely consumed, its ashes may weigh one-quarter ounce. Therefore, the smoke must weigh three-quarters of an ounce—so maintain many people and hundreds of articles, as well as a good many books.

However, the logic is faulty. While the smoke—that is carbon particles—account for some of the weight, actually the amount is extremely small, varying with different cigars. Most of the missing three-quarters of an ounce is *moisture*—water. The heat of the burning cigar drives out this moisture into the air, but you can't see it. Thus most of the weight in cigars or cigarettes is plain water. We had better rename the cigar a *cigaqua*!



\$10.00 FOR EACH STRANGER THAN SCIENCE-FICTION*

EVERY month this magazine will pay \$10.00 for each accepted short item under the above heading. Each contribution may be as short as 100 words, but not longer than 400 words. All shorts must be factual, scientific,

correct, but not fiction. Give science source if possible. You may send as many items as you wish. In case of duplication, the entry bearing the earliest post office date will be used. Address letters:

*Prize pending U. S. Pat. Off. STRANGER THAN SCIENCE-FICTION, 35 West Broadway, New York 7, N. Y.

future space suits

by DONALD H. MENZEL, Ph.D.
Acting Director, Harvard College Observatory

WE ARE RAPIDLY approaching the day when man, using the magic power of atomic fuel, will leave the earth behind and rocket into the depths of interplanetary space. We already have seen a preview of certain accessories of such travel, chief among which is the "space suit." Popular and impractical versions of the space suit appear on various television programs or may be purchased at the local five-and-ten.

The protective envelope that the well-dressed traveler must don before he ventures into the vacuum of space presents many problems of engineering that require study and solution. The artist's interpretation of such a suit appears on the front cover, and the same suit is diagrammed on this page.

The chief problem and the one most difficult to solve is the invention of a flexible fabric, or plastic, capable of withstanding an internal pressure of 15 pounds per square inch. And, since a rough estimate sets the surface area of such a suit at some 4,600 square inches, the total pressure that the suit must withstand is 70,000 pounds or 35 tons. Although the internal pressure will doubtless cause the suit to expand slightly, freeing it from the human body, it must show no weak spots or bulges.

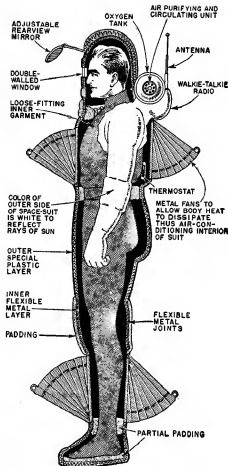
The pneumatic tire of today can withstand similar pressures. Indeed the space suit of tomorrow may well be constructed on a not dissimilar plan, wherein the traveler first puts on a loose-fitting airtight suit, which acts as a sort of inner tube. The outer wall of the space suit then acts like the casing of an automobile tire, providing a limiting wall against which the inner suit can expand when it is inflated. This outer casing will also be ribbed or reinforced to give extra strength and also will be fitted with flexible joints. The double-walled window, one sealed into the inner tube and the other into the casing, adds protection, and prevents fogging or the formation of frost.

The space traveler must carry his own supply of air, because he could not survive in the vacuum of outer space. Means of circulating and purifying the air are necessary. Whether extra air is carried on the back in a tank or supplied from the accompanying ship will depend on circumstances. For communication purposes, he must carry his own radio with external antenna, since sound does not travel through a vacuum.

The suit must perform one other function, as well. It must protect him from the blistering heat of the sun on one hand, and the bitter cold of interplanetary darkness on the other. We all know how hot a cement sidewalk or an automobile fender can get in the open sun. They would attain even higher temperatures if cooling streams of air did not blow against them. Outside the Earth's atmosphere, a suit with a black exterior, exposed to the scorching blaze of the sun, would become hotter than boiling water. With a suit of white or reflecting material, and a thick layer of insulation in the casing, the wearer is protected against the hazard of being burned or roasted by solar heat.

However, the thick, insulating layer introduces a new complication. Suppose that you were forced to remain in a completely insulated chamber, with a 150-watt light burning beside you. The heat from the lamp, unable to escape, would go to the only spot it can go, namely, into your body. In one hour, you would be suffering from 3° F. of fever. In two hours, you would be unconscious. In three hours, you would be dead!

The man in the insulated space suit is exposed to a similar danger—except that the 150-watt lamp is *himself*. His body heat, no longer able to escape so readily, could cause severe discomfort, at the very least. Hence the air-circulation system must also become an air-conditioning system. The pumps and supply tanks on the space traveler's back form an automatic refrigerating system, controlled by a thermostat in the suit. Every refrigerator must have an attached radiator, where the extra heat



(Illustration by Frank R. Paul)

is lost from a surface at high temperature. In the illustrations, these are shown attached to the legs and body. These radiator fins can open or close like a fan to provide for additional regulation. Further, the humidity inside the rubber casing will be 100 percent, the result of both perspiration and moisture in the breath. To keep the atmosphere dry, as well as cool and pure, the circulating unit must contain a dehumidifier, which will entrain, condense, and perhaps freeze the moisture. Water is valuable, to be conserved, purified, and re-used.

The rear-view mirror at eye-level performs a service similar to that of reflectors on the modern automobile. It is, however, even more important, because the wearer of the suit has his vision limited by the double wall of the helmet. The position for best view to the side or rear can be controlled by the wearer.

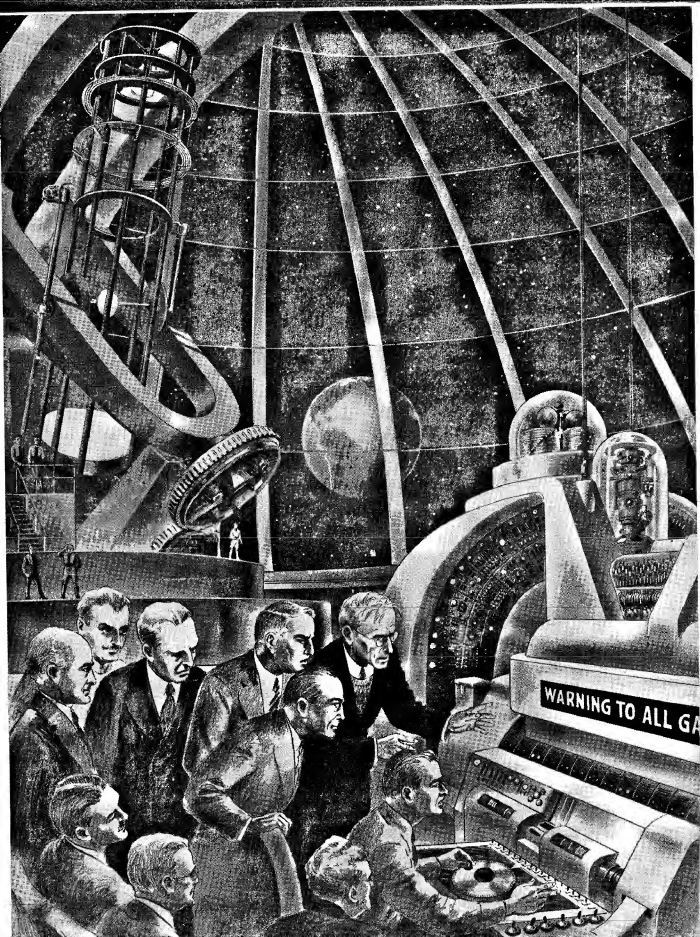
The traveler, floating freely in space, feels strangely unable to control his motions. The center of gravity of his body stays put, no matter how he moves his limbs. He will generally have to rely on cords or on cables connecting him to the space ship. He can learn a limited control without such artificial aid, flexing his arms and legs in a rotary manner, as a cat dropped upside down makes a rapid turn in midair, to alight on its feet.

The cover shows a space ship in regions far from the Earth, in the vicinity of the planet Jupiter, where solar light and heat are 26 times less intense than on the earth. Jupiter has great streaks of yellow-brown clouds parallel to its equator, the so-called "belts." The oval marking is the "great red spot," whose true nature is still unknown. The visible face of the planet consists of atmospheric gases and clouds. Methane (or marsh gas) and ammonia are abundant constituents, which are partly frozen out from an atmosphere composed chiefly of hydrogen. The outer layers of Jupiter's atmosphere are about the temperature of liquid air. The atmosphere is thick and any solid surface must lie far below the visible outer layer.

Several of Jupiter's moons, 11 in number, appear in the picture. One of these moons is as large as the planet Mercury. The smallest are irregular chunks of rocks a few miles in diameter, perhaps asteroids captured by the planet by chance.

The men are making some repairs to their space ship. We must hope that the trouble is not serious, for otherwise the gravitational pull of Jupiter may capture ship and occupants, thus forcing them to become an extra satellite.

THE COSMIC



BLINKER

by EANDO BINDER

(Illustrations by Frank R. Paul)

Though the military considerations of a station in space have been emphasized by scientists, probably with the hope that such an angle might facilitate funds for such a project, one of the greatest benefits to accrue from successful establishment of a space station or an ultimate base on the moon would be the advantages of establishing an astronomical observatory. The effectiveness of our present telescopes would be increased manifold, once outside the deep ocean of the earth's atmosphere. The new clarity of observation would unveil many of the universe's greatest mysteries—but, just as surely, add still greater mysteries to take their place. Binder tells, with considerable imagination, the story of a variable star that didn't conform.



Binder has told us that he is back in science-fiction to stay, and hopes to attain his former position of favor with the readers. Furthermore, he is intent on achieving his goal by writing material that is essentially pure Binder, with concretion to no special formula. We can't argue with that kind of integrity and spirit.

"MYSTERY of the ages," muttered Robert Oxman, senior astronomer, coming out of the darkroom with a damp plate.

Paul Darby turned from his dials. "You mean that variable in M-81?"

It was quite an unnecessary question, for that was all the old man ever talked about these days.

"What is it doing now, sir?"

"Cutting up capers as usual," said Oxman bitterly, swallowing a white pill. "And giving me ulcers. There's no rhyme or reason to its behavior. It just doesn't fit in the scheme of things."

He looked up out of the huge steelophone dome, through its clearness, at the piercing stars swimming in space. The unwinking stars. Here, at the Lunar Observatory, were the ideal conditions for observing the outer universe. A hundred yards away the Giant Eye hummed, keeping on target with the majestic revolution of the sun-sprinkled vault above.

The target had shifted now, but before it had been M-81, the spiral galaxy some two million light-years away. And within the myriads of M-81 pulsed one star, brighter and dimmer, ceaselessly. A Cepheid variable, but standing by itself in its unorthodox data.

"Mystery of the ages," Oxman gritted again.

Other staff astronomers at nearby desks exchanged grins with one another. As long as they could remember, old Oxman had harped on that worn dirge. Assigned to Cepheids some forty years ago, the topmost living expert on them, Oxman had spat out that phrase day in and day out. Always in baffled dismay. His tall gaunt figure jerked with the words. His wrinkled eyes held weary frustration.

"See here," said Stanhope of red giants, whose desk was nearest. "You're making too much of a thing out of this, Oxman. A mountain out of a molehill."

"You think so?" Oxman snapped peevishly. "Mind you, this thing has been going on for five thousand years. Since the 20th century! I'm the last of a long line of astronomers—hundreds of them—who observed Old Unfaithful, wracked their brains over it, and never came up with any explanation." He glared. "Tell me, have you any red giant mystery unsolved for five thousand years?"

Stanhope subsided with a sigh and turned back to his own work.

Paul Darby, young and new to the staff, was more receptive. "Old Unfaithful," he chuckled. "Guess that name fits all right."

"Like a glove," nodded Oxman, sourly. "That Cepheid was first spotted by the old-time 200-inch

Palomar scope, back in 1950. From that day to this—five thousand and forty years later—it was watched constantly. We have mountains of photographs of it. A hundred trained minds puzzled over it, generation after generation. A mystery that spans time from the 20th to the 70th century—unsolved!"

Then, apologetically, "Sorry, I must be boring you, Paul, like all the others—"

"Please go on, sir," Darby invited quickly, with a spark of pity for the old man. "I haven't heard the full story of Old Unfaithful. Besides, I have time to kill while Brains wrestles with his homework."

Darby grinned and patted his machine. He was the technician handling the electronic brain that digested all the observatory's cosmic equations. "Brains" clacked and hissed beside him, working madly at the moment on a complex problem of red shifts. While his ingenious mechanical partner labored, Darby was at leisure. He waited with willing ears.

Oxman leaned back in his chair, nesting his hands, and the words tumbled out of him as if relieving an ache inside him.

"There are many kinds of variable stars. But you see they all dim and brighten at regular intervals. Their periods may range widely from a half-day to five hundred days. Their luminosity may jump and fall as much as nine magnitudes. Their spectrums may vary from red giants to white dwarfs. But they all have constant, unchanging patterns of their own, regular as clockwork. All of them. And after a thousand years they'll still be doing the same thing. You can depend on them, as . . . well, as they do on Old Faithful, that geyser down home in Yellowstone Park."

"But Old Unfaithful," Darby asked, "has never repeated his pattern, not even in five thousand years?"

"Never," snapped Oxman, almost with a growl. "Not once. He's got a new bag of tricks every time an old fool like me takes a squint at him. No pattern—and it's really quite impossible, you know. It throws all our well-ordered theories of the universe out the garbage chute. It cracks the very foundations of the cosmos, as we know it."

Stanhope turned from his desk with a snort. He pointed up at the unmoving vault of stars. "I don't see the universe falling apart," he jibed, grinning. "Looks quite stable to me."

Oxman tried to ignore him but winced visibly.

Darby hastily filled the gap. "But I don't quite see. Why is it impossible for a variable to have no pattern?"

"Because," spat Oxman in tones tinged with high

blood-pressure, "it's the *only* fool star in the entire macrocosmos that we never fitted into *any* theory. Think once. There are maybe a billion galaxies out there. All of them contain Cepheids, red giants and white dwarfs, nebular clouds, coalsacs, and star clusters, multiple suns, dead companions, red shifts, and so on down the line. But one theory covers *all* red giants in *all* galaxies. One theory covers *all* novae in *all* galaxies. Without fail. There are never any renegade exceptions. And of the billions of Cepheids we've catalogued, in the billion galaxies, they all fit theory perfectly."

He pointed a damning finger upward. "All except *one*."

"Old Unfaithful," murmured Darby, struck by the wonder of it himself. "Quite a bad egg, eh?"

"If it's any consolation," spoke up Stanhope again, with a straight face, "maybe other astronomers in other galaxies besides ours are getting ulcers from Old Unfaithful too."

In spite of his rage, Oxman had to smile. Other galactic observers *did* see Old Unfaithful, of course. They too must be fuming at its outrageous deviltry. Silly as it was, this thought made Oxman feel better.

"Yes, maybe a million other observers, in a million other galaxies, are cursing Old Unfaithful, too. Watching him blink on and off like a will-o'-the-wisp, running through his crazy repertory, in a series of totally unrelated flashings, like a lighthouse gone wild in far space. A beacon handled by a madman—"

Stanhope burst into a genuine laugh. "You know, Oxman, the way you put it there, it almost sounds like a *message*. Something like Morse code, for instance—only of course a different code entirely. I can just picture some mad magician in M-81 playing around with Old Unfaithful, flashing out a mocking message."

After a glance at Oxman's stricken face, Stanhope sobered and choked down his laughs. "I'm sorry, Oxman. I didn't mean to needle you like that about your pet headache. Sorry if I touched your sore spot."

Oxman was staring as if his brain had exploded. "Message!" he repeated. He quivered, swallowed. "What if it were just that—a *code* flashed across space from M-81? From intelligent beings there?"

Stanhope swung his chair back. "Now, you're *not* taking me seriously," he protested, startled, alarmed. "Get hold of yourself, Oxman. Don't let this little star get you down."

"But that's the answer," Oxman whispered. "Stanhope, you hit it. Instead of a crazy *natural* variable, why not a Cepheid *controlled* by intelligence? The answer was so simple and obvious—for five thousand years—and nobody caught on!"

Stanhope and Darby both gaped. The old astronomer kept spilling out words eagerly.

"Don't you see? You meant it as a joke, Stanhope, but it fits perfectly. People in M-81 wish to communicate with us, or any other galaxy. No ship can cross the immense gulfs, no ship we know of. And very likely no ship they know of. Radio waves too become too weak for anyone to pick up and amplify. Even beamed telepathy, such as we use, can't stab those inconceivable miles. But the one thing that bridges the universe from end to end is *light*. A light-signal is the only sure way to set up communication between galaxies. And that's what the people of M-81 have done."

"You sound mighty certain," Stanhope said, skeptically. "But think, that means they somehow manipulate a giant star. Make it pulsate, dim and bright, according to their code. How do you go about doing that little task?"

"Who knows?" said Oxman, singing inside. "And who cares, really? So they're master scientists. They have giant machines or rays or some method of making Old Unfaithful pulsate varyingly. Maybe they have the secret of controlling the atomic energy output of Old Unfaithful, as we control an atomic pile. Anyway"—he brushed that aside sweepingly—"there you have it. A message flung across space to another galaxy. And we idiots took five thousand years to catch on."

"Too bad," put in Darby, unthinkingly, "that whole message lost—"

"Not on your life," Oxman yelled, running to the files, forgetting his rheumatic knee. "We have complete microfilm records of Old Unfaithful from 1950 on. His whole message. Here, in this drawer—"

Oxman yanked too hard, and the file labeled M-81 spilled its contents all over the tile floor. It took them a painful, breathless hour to sort out all the canisters of microfilm. Even Stanhope helped, as well as Darby.

At last Oxman held them up, the complete records of Old Unfaithful. "Now to *read* the message."

"**B**UT how can we?" objected Stanhope, a little stunned by what his chance remark—in sheer jest—had started off. "What basis of comparison will we have? Naturally, the people of M-81—assuming they exist—never devised the Morse code, or the interplanetary code, or any code we know of. What's more, even if we cracked the code and got words, what words would they be? Unknown words of creatures using a language we don't know. One impossible hurdle after another. It's hopeless—"

"No!"

The word came like a shot from young Darby. "Brains over there—the electronic brain. He solves every other problem in galactic astronomy, many of them staggering to the human mind. We just feed him the data and he does the rest. Brains can crack the code, I'm sure. Translating the language will be tougher, but he'll do it."

Brains was not a giant computer. It was no more than ten feet wide. But it was packed with mental might. Countless tiny transistors and incredible mazes of synaptic relays and spongy centers of metallic cells added up to a thousand human minds. And Brains had not yet met a celestial riddle that it could not solve within twenty-four hours.

"I'll have to get clearance for Brains from the director," said Oxman, turning to the intercom box on his desk.

"Can't you wait a few days?" answered Director Peterson, chief of Lunar Observatory, petulantly. "After all, a dozen other computations are ahead of yours, waiting their turn. How about three days, Oxman?"

Oxman sucked in his breath, spoke savagely.

"You can't do this to me, Peterson. I'm an old man. I have ulcers and a weak heart. I may die any day. And if I were to die without knowing the message from M-81, I'd *haunt* you for all eternity."

"All right," said Peterson, half stern, half coaxing. "Tomorrow, then."

"Now!" yelled Oxman. "This minute! I've sweated over Old Unfaithful for forty years. A hundred other Cepheid men are turning in their graves every time Old Unfaithful blinks. Now, Peterson—it's got to be *now*!"

"Look here," began Peterson weakly. "I don't have to remind you that I'm in charge here and—"

Oxman smashed the voice box. He turned to Darby.

"Whatever's in your machine now, throw it out. And don't worry about Peterson. By the time he comes running here, we'll be started, and then what can he do?"

Darby hesitated even at the fire in the old man's eye. Stanhope was shaking his head too. "You shouldn't do this, Oxman," he protested. "Bucking Peterson's authority . . . taking matters in your own hand. He could break you for this, and break me too, for helping you!"

Stanhope was carrying microfilm to the electronic brain. "Well?" he snapped at Darby. "What are you waiting for? Clear Brains and get started. And I hope Peterson has a stroke."

Darby quickly cleared the Brain. Holding his breath, he fed it the microfilm of Old Unfaithful. Brains was specially designed for astronomy. Microfilm plates of stars and galaxies were its grist. All Darby had to do was adjust the dials mathematically, asking it in formula form to integrate the blinkings of Old Unfaithful, which he fed into the machine as M81VC889, the star's official designation.

Then he stepped back, beside the two older men.

"What will the message be?" Oxman breathed. "What are the first words we'll hear from any outer galaxy, in the entire universe around us?"

"If the machine can handle it," said Stanhope, skeptically.

The electronic mastermind hummed and clicked and chewed and ruminated. After a while a faint buzz sounded from it. Darby looked blank. It had never made that particular sound before.

A moment later there was a loud click and then the machine ejected the microfilm and fell silent.

They stared at the lights fading from its reading tape.

Rejected. Cannot solve.

"See, I told you," said Stanhope, sorrowfully. "Even Brains couldn't do anything with that double brain-breaker . . . an unknown code and an unknown language."

Oxman stood stricken, haggard, inwardly collapsing.

"The first time—the first time Brains has ever been stumped. Now we'll never know if that was really a message or not. Forty years . . . hoping to solve the mystery . . . mystery of the ages . . . go to my grave without knowing. . . I'll never know. . ."

"Oh yes, you will," said a quiet voice behind them.

Stanhope whirled. "Peterson," he gasped.

"Don't you see what's wrong?" Peterson said. "Brains never handled code and language before. He has no 'memory' of such things, to start with. So we'll give him a memory, educate him up to it."

He turned, singling out one of the other astronomers, who were there, now, in a silent excitement which had swept through the observatory. "Emory, go over to the library and bring back all books on Morse code and every other code. Cryptograms. Anagrams. Basic English. Planet languages. All that stuff. Give him a hand, Smith."

Peterson turned away from Oxman before the old man could express his gratitude. "Good luck, Oxman. Let me know when you crack the mystery of Old Unfaithful."

eye. They worked up to the Interspace code, then complex codes from the last space war. Then they poured in language fundamentals, climaxing it with the fearfully complex native language of a dead race of Procyon.

Oxman, Stanhope, and Darby. They worked as a team, spelling each other for rest.

Finally Oxman called a halt. "Enough. Brains has a 'memory' now of codes and languages. He can break any code, into any language. Feed it the code of Old Unfaithful again."

Again they waited in feverish anxiety, as Brains began his low, laboring whine. Five minutes passed. Ten. But the reject sign did not flash on, this time.

Relaxing slightly, Darby pressed the timing stud. "Brains can always tell you how long it'll take him to solve a problem. Let's see how much time he needs for this one—"

The lights read—*Nineteen hours, twenty-three minutes, fourteen seconds.*

"Poor Brains," muttered Stanhope wryly. "The longest he ever took before was slightly over nine hours. This one will take twice as long. Can he get ulcers?"

Oxman groaned. "How can I wait that long? How can I wait twenty hours for that message from M-81?"

Stanhope chuckled. "You? Those others ahead of you waited five thousand years. What does twenty more hours matter?"

But to Oxman, those twenty hours were longer than five thousand years. He didn't sleep or eat. They forced coffee on him as he sat and watched Brains, as eternity after eternity he kept clicking and humming, wrestling with the most Herculean mental problem of all human history.

Stanhope didn't sleep either. Darby did, in fits and snatches. Nor did the rest of the thirty staff men take away much time from the vigil. They stood around in groups and knots, whispering, their own work shelved, forgotten.

"My exploding novae," said one. "Small stuff compared to this—a message from another galaxy. And here's Peterson again, for the twentieth time. Why does he bother *pretending* to work?"

"Well, let me know the results right away," Peterson said, after hovering around for a while. "I'll be in my office waiting . . . have important work to do, you know."

He took two steps away, then turned back. "Oh rubbish. Move over, Stanhope. Why should I jitter alone in my office?"

They talked at times, in the dead moon quiet.

Stanhope came up with another brain teaser.

"Look, Oxman. M-81 is two million light years away. That means the message was *first sent* that long ago. Are those people even alive today? Maybe it'll be a message from the dead. A hello and farewell from a civilization long since fallen to dust."

"That's a possibility of course," said Oxman. "In which case they must have set up some kind of long-range method of pulsating Old Unfaithful, even beyond their extinction. Queer thought, isn't it?"

Peterson was struck by an amazing afterthought. "Why would they bother? Why would they go to such fantastic lengths, somehow to manipulate the fires of a gigantic star, just to say, 'Hello, neighbors! Greetings from M-81. The weather's fine here. Come and see us sometime, only we'll be dead and buried by then!' It doesn't make sense."

"I think," piped up Darby, "it would have to be an important message. Maybe a *distress* call, assuming they're in danger and need help."

IT WAS a long job. All night they labored. They fed Morse code to Brains, who solved it in the wink of an

"Help that wouldn't and couldn't arrive till millions of years later?" Stanhope said. "Hardly. The only other possibility is that it's a . . . well, a *warning*."

They cast wondering glances at each other.

"But that's absurd too," Peterson said. "It takes us two million years to *receive* the warning. If it's danger that hit them, and that might hit us, would this danger take two million or more years to reach us? Would we have time to avoid it?"

Oxman rubbed his tired face.

"We can't use ordinary space-time concepts here. The signal itself—look how they stretched it out over a period of five thousand years. In other words, there was no 'hurry,' in earthly terms. They carefully laid out their message to span fifty centuries, to warn us of a danger that might be millions of years in the future. It's all on such a colossal scale that numbers and years mean nothing."

Peterson nodded. "Astronomical time is the only sensible yardstick to use—some cosmic clock in which five thousand years is one minute. Thus the message is flashed out in that one short 'minute' but many 'days' or 'weeks' ahead of the actual danger. And therefore we are given plenty of time to avoid it."

"How do we know it's a warning?" Stanhope was now skeptical of his own suggestion.

"We don't," admitted Oxman. "Yet somehow—"

He fell silent, but to them all, a warning seemed to be the only logical explanation for the cosmic telegram flashed across the transgalactic void.

At last Darby held up a hand and began to count. "Five—four—"

There was a stir among all the waiting men in the dome.

"—three—two—"

Heavy breathing.

"—one—zero!"

Silence.

Then a buzz. Promptly on time to the second, Brains flashed out his lighted message across the moving tape. The electronic genius had done its job, not only cracking the code of the pulsating star, but ferreting out the language behind it, and then translating those words into our language.

Darby's face held pride. And perhaps the hum of the machine, too, was triumphant at its nameless feat.

And at last the answer was there, before their eyes, the message from M-81.

"Warning to all galaxies. Danger awaits to strike you, as it has struck us. But before we were wiped out, we sent this message."

"We caused one star to fluctuate like a variable, by means of subatomic force-fields that serve as curtains around the star. We installed the controlling unit on a planet of that star, set to continue flashing its signals long after we were gone."

"A synchronized tape message automatically controls the unit, making the star flash bright and dim according to a universal code built from pure mathematical fundamentals. Intelligent beings with astronomical science would note the variable star that obeyed no known laws, and soon realize that it conveyed a warning."

Soon, thought Oxman wryly . . . five thousand years . . . and yet maybe that was soon, on the clock of cosmic time . . .

Do not fear sudden doom. The danger must cross inter-galactic space, and must travel far slower than light. Thus our warning at the speed of light will certainly reach you long before the menace. You have time to prepare and avoid destruction. The one clue that would have saved us came too late, but we can pass the secret on to the rest of the universe. The invading horror is an amorph—"

On the screen, the flashing words stopped and the machine fell silent.

Stanhope groaned. He was the voice of them all as he almost screeched and said—"The rest? What's the rest? Of all times for Brains to break down! Fix it, Darby. And hurry, man! We want the rest of it."

Stanhope's voice stopped dead, at the look on Darby's waxen face.

"Brains didn't break down," Darby said, stricken. "Remember, it took five thousand years for Old Unfaithful to transmit this much. Perhaps it will take another five thousand years—"

"No!" whispered Peterson in horror. "Oh no!"

Darby wept as he blurted out the rest: "Brains came to the end of the message—as much as was transmitted so far. I will never know more than a few more words, even in my lifetime—and I'm the youngest man here."

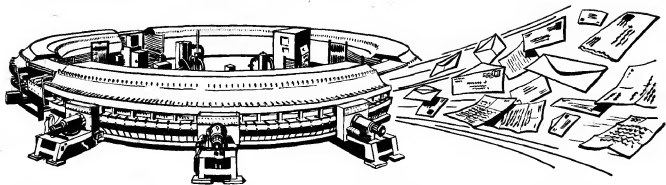
None of them dared to look at the face of Oxman, who was over seventy. +

SCIENCE QUIZ

Test your scientific knowledge with this questionnaire. The answers are in the fiction stories on the pages listed.

1. What is *psychokinesis*? (p. 6)
2. What is meant by *clairvoyance*? (p. 6)
3. Are all variable stars the same size? Do they have similar spectra? (p. 21)
4. What is the meaning of *Xenophobia*? (p. 41)
5. Has a human egg ever been fertilized outside of the human body? (p. 59)
6. Does an embryo share its mother's blood circulation? (p. 60)
7. What nourishes a human fetus? (p. 60)
8. By what process are fluids passed through thin membranes? (p. 60)
9. How does Einstein define the fourth dimension? (p. 61)

CHAIN REACTION



AS THIS ISSUE goes to press, the first, March, 1953 number of *Science-Fiction+* has been on sale only ten days, but already more than six hundred letters and cards have arrived giving us an excellent idea of your reaction to the magazine.

The size, design, layout, and general format have been universally acclaimed. Typical of almost all of the letters are the statements of Dr. Thomas S. Gardner, renowned gerontologist of Rutherford, N. J., who writes: "The make-up of the magazine is fantastically good. The layout, illustrations, printing, and general appearance are slick quality. It reminds me a lot of the *Scientific American* at which no one can sneer. You and your staff have done a marvelous job on the technical end of the magazine."

Several letters received complained that they didn't feel they were getting enough wordage in the magazine. Our pages are deceptive. The fiction pages contain 1,300 words of text and the nonfiction and columns from 1,500 to 2,700. Our total wordage comes to 70,000 words, more than the average novel. We made a check of several of the leading digest-size magazines. One contains 60,000 words in 160 pages including all departments. Another, utilizing smaller type, manages 68,000. *We actually give you more wordage than the average 160-page digest-size magazine and in a larger size, more readable type!*

Some readers state that our fiction may prove "old-fashioned" or too heavily scientific. Actions speak louder than words, and we doubt if a better written, more modern style of writing appears anywhere in science-fiction today than exemplified by Harry Bates in his remarkable story in this issue, "Death of a Sensitive." We do maintain, however, that science-fiction has strayed too far from sound scientific precepts in recent years, and we are insistent that our authors base their material on valid scientific facts, otherwise the stories become sheer fairytales, fantasy. Beyond this we want slick, modern, competent writing. We are not trying to turn back the clock, but we are attempting to restore the proper balance between science and fiction in stories. If you take all of the science out of science-fiction or dilute it to the vanishing point, you no longer have science-fiction no matter what direction you may argue from. On the other hand, we shall be careful not to swing to the other extreme and overload the story with excess science. Our intentions are simple. To publish true science-fiction as much as possible.

SCIENCE NEWS SHORTS has proven even more pop-

ular than we had hoped. We would be interested to know if the present length of four pages is satisfactory, or if you would like it lengthened or shortened.

Though only a small percentage of the number of reactions we expect to receive are in, Philip José Farmer with his story "The Biological Revolt" is substantially leading the other stories in the first issue in popularity. Yet it is interesting to point out that there was no story in that issue that did not receive dozens of first-place votes or a fair sprinkling of last-place votes; so some concession should be allowed for diversity of readers' tastes.

Particularly striking is the number of letters received from people who never read a science-fiction magazine before. One enthusiastic clergyman writes: "In 1926 I was 10 and first saw *Amazing Stories*. Never got around to reading anything like it—'til now."

Many readers expressed joy at having a science-fiction magazine that they could carry around and admit to reading without apologies for the format.

Collectively fascinating was the diversity of occupations of the readership. While there were very powerful representations of scientists, technical men and students, others came from all walks of life, housewives, professional men, salesmen, taxi-drivers, farmers, warehouse men, politicians, businessmen, actresses, factory workers, white collar workers, and dozens of other categories.

Readers in the science-fiction field are very observant, and many small, pertinent criticisms were forthcoming. Most of these failings we were aware of, and time and new issues have invalidated them, but we really want a continuous flow of constructive criticism, since we are scientifically breaking down all comments received and acting to fulfill the desires of the majority of the readership. We would be particularly interested in the reaction to individual art-work in the issues, for which subject there was no room for comment on the issue cards.

Our intention is to publish a science-fiction magazine that science-fiction readers will be proud to hold out as an example of what they want. A magazine that they can take pride in, that will attract the serious attention of the world's leading scientific and literary men and be accepted into the living rooms of the most discriminating. We realize that we aren't perfect yet, but with the full support of the readership we feel that we have the finest potential of any science-fiction magazine in history.

—The Editors.

the proxy head

THE TALL YOUNG MAN stalked through the hotel lobby and headed for a door marked MEN.

Once inside the washroom he stood indecisively for a moment, then went over to a cubicle and deposited a nickel. The door swung open.

He entered, shut the door, listened to the click.

The click echoed a different click . . . click . . . click . . .

The tall young man reached up, removed his wig, and opened the top of his head.

He stood there, concealed in the cubicle, and his long slim fingers worked with the precision of delicate instruments. They made certain adjustments inside his skull, testing and setting and manipulating.

Sonic a little off, he registered. Visio good but sonic reception poor. The street-noises tended to knock out the adjustment, sometimes. Change blueprints on next model, he registered. Allow wider range of compensation.

Vibratory reception worked perfectly, though. The orders from the control vessel came through constantly and with no interference. He knew what he had done, what he was doing, what he must do at all times.

His instrument-fingers completed their work inside his cranium. For the final check, he pressed the voice-hox and uttered a few experimental sounds. A cough, a sigh. The noises echoed in the hollow washroom. Perfect.

Satisfied, he closed the slot in his head and carefully adjusted the wig once more. It was a handsome wig—real human hair, blond and wavy. He didn't know where the Hostiles had acquired it; probably from the raiding expedition last month when they came down to the desert and picked up those three men. What were they called?

Prospectors. The message came through vibratory reception immediately. That reassured him. His guardians were with him every minute, watching him and guiding him. They knew men, studied men, and would supply him with whatever information and instructions he needed under any circumstances. They were exactly aware of what they were doing at all times.

Although the Alien robotears were in the ship, a hundred miles up, they would always be with him through the medium of the vibratory receptor huilt into his body.

The young man smiled. Rubberized, synthetic epidermal tissue, carefully coated with plastic, responded instantly. The pseudo-lips parted, disclosing the gleaming perfection of false teeth. A soundless mechanism simulated muscular action. The smile, like everything else about the young man, was perfect.

A great surge of confidence came to him through the receptor. The Hostiles were proud of him, proud

Every time there is a lull in the news, the newspapers begin highlighting the reports of strange objects and "flying saucers" seen in the skies, and embellish their stories with wild conjectures as to the existence of these objects, their possible origin and their purpose. A most popular theory suggests that they are extraterrestrial observers. Actually, a really intelligent nonhuman race might have means of getting their information a lot closer to the source and with great authenticity. Consider Mr. Bloch's views on the possibility.

by ROBERT BLOCH

(Illustrations by Charles Hornstein)



Robert Bloch is perhaps best noted for the touch of humor to be found in many of his stories. Despite this, he has done some of his best work in a serious vein. His novel, *The Scarf*, has obtained considerable popularity, and his short story collection, *The Opener of the Way*, has won favor.

of their work. And well they might be. Wasn't he entirely their creation? Hadn't they studied human anatomy, duplicated it perfectly and with utmost cunning? He could go anywhere, do anything, and never be suspected.

Never be suspected. That was the big thing. A spy must be careful.

That was part of the receptor's work, of course. To be careful for him. He was a mere machine. His consciousness was itself an illusion; actually he was only a highly evolved and complicated sending-receiving-registering mechanism. The combination gave him, in the aggregate, a sort of individuality, but it was neither necessary nor important.

Like the consciousness of men. That wasn't important, either. Stupid, imperfect men—how simple it was to deceive them! His creators, up there in the ship, knew just how to do that. Men are easy to fool. You can do anything you please on this planet if you know how.



"A cat saw him and suddenly arched its back, snarled and spat."

Last night, when he was dropped, for example—dropped in an adaptation of mankind's own "parachute." He was given no conditioning or instructions; all he had to do was follow the orders and impulses coming through the receptor.

He'd landed in a condition described as—?

Naked. The word was supplied to him immediately (they knew everything, everything).

He landed naked. That is to say, without the customary body-covering. According to the rules of mankind, this was wrong. He'd be noticed. So the receptors sent him into the city under the cover of darkness. Told him how to skulk, to hide, to creep ever so cautiously up to the window of the clothing store on the dark, deserted street. And the receptors guided him so that he used his brand-new body to smash the window, smash the sign reading, **MONEY TO LOAN—WE BUY AND SELL.** And he found the clothing, put it on. Mechanical fingers mastered the

new intricacies of dressing, of putting on shoes and tying a tie.

That would have looked odd to men, if there were one around to see. A life-size mechanical doll, dressing itself in a pawnshop . . . grotesque—frightening.

The receptor interrupted, now. *You mustn't frighten them, it communicated. Not unless ordered. You are to be quiet. Do nothing to attract attention. Your job is to observe, react, record. That is all. And remember the dangers.*

Remember the dangers?

It was hard for his mechanism to translate "remember" into a process and "dangers" into a realized phenomenon. He stood there in the dark cubicle and waited for awareness to come. It came.

Hastily, he backed away from the bowl. That was one of the dangers. Water. Water and oil and any liquid. His eyes, his nostrils, his mouth, the aperture

under the wig must be protected from moisture. Even dampness would destroy the delicate balance that enabled him to function.

There would be no rain for forty-eight hours. That was known. No danger there. But he must *avoid moisture*.

He looked down at the water in the bowl. It looked so harmless, but it was dangerous. Dangerous to him. Not to the Hostiles. They had no such make-ups to have to protect. *For them*, this planet was quite suitable. They had waited and watched and experimented and spied for a long, long time now, until certain that everything would be ideal here.

All that remained was to assess and analyze the present occupants—mankind. Mankind was many, and the Hostiles were few. The single ship possessed potential power and they could do almost anything, but the sheer weight of numbers promised victory to mankind, provided that mankind was ready to exist.

That was his job, now. To react and record. To move among men and assess them, analyze their—*psychology*, the word came from the receptor, to-gether with a complete file of meaning.

He would spy on men. He would determine, or rather, the Hostiles would determine through him, whether mankind would resist a sudden surprise attack. Were men aggressive enough to put up determined resistance—or, as they presently surmised, would mankind flee from unknown terrors in blind panic?

It would not take long to find out, now. The ship was up there, ready. They were ready. And he was ready. Ready to go out, to react and record.

HE LEFT THE cubicle. There was water in the outer washroom, but he avoided it. He avoided strong lights, too, as directed; he had to avoid places and situations where he'd be expected to—what was it?—*eat and sleep*. Yes, and he must not *touch* anyone or be touched. He knew these things, and many more.

The receptor guided and directed him. It did not furnish explanations until necessary. Then explanations and proper reaction-patterns were instantly available.

Right now, for example, in the pocket of his *suit-coat* was a silver object. He had been directed to put it there last night when he broke into the pawnshop. He didn't comprehend why. He had been given no further instructions or orders. Those would come when needed.

He walked across the deserted washroom.

Then the door opened. Two men came in. A fat old man and a thin young man. (*Old and young*; he knew about that, how to recognize and distinguish all physical types.) They looked at him with the blank impersonality, almost as if they knew that he was a machine, and continued their conversation.

The communication came to him.

Walk over to them.

He walked, heels clicking hollowly on the wash-room floor.

Put your right hand in your pocket.

The hand moved on its errand.

Pull out the object and display it.

The hand came out.

Speak as directed, soft voice.

He said, "Put up your hands!"

They looked at him, eyes goggling in sudden shock. The older man said, "Look, he's got a gun!" They raised their hands.

Get their money.

The communicator told him what *money* was, its appearance and purpose as a medium of exchange; in a single instant, all of the data on currency was transmitted to him.

And at the same time, the communicator directed him to get the money; told him how to search their pockets, how to find wallets and loose change.

He got the money quickly, visio functioning and sonic on, in case of interruptions. But there were no interruptions. The two men stood there, breathing heavily, eyes fixed on the gun in his right hand as his left hand moved inside their pockets.

For one paradoxical moment, the two humans were standing like machines while he was animate, purposeful, alive. Their roles were reversed.

Something made a calculation, observed their reactions and estimated. The message came. *They are afraid of you. This is fear. This is what to look for in men. Find fear.* And when he came into their aura, when his pneumatic fingers touched them, instantly another mechanism located where a stomach would normally be, caught and recorded their respiration-rate, their pulse-rate, the delicate glandular reactions. This was fear. He would recognize it in the future.

Commands came to him and he carried out orders. He told the men to remove their trousers. He deposited another nickel, herded them into a cubicle and slammed it shut. He opened the washroom window and dropped the trousers into the outer, empty courtyard.

Then he left the washroom. The money jingled in his pocket, and the bills rustled against his chest. He walked quickly out of the hotel.

It was getting dark (a lengthy astronomical explanation was flashed to him so that he'd understand) and he had duties to perform.

He made a handsome figure as he strode down the street, tall, blond, youthfully erect, walking stiffly and confidently. Men stepped aside as he marched forward, and women turned their heads. A girl remarked to her friend—"I sure would like to know where they make guys like that."

But there was no room for humor, or irony, or any temperament whatsoever. He had duties to perform. They were to *react and record*.

Up above, in the ship, a complicated apparatus traced his progress through the streets. A disc recorded the sound which his sonic detected. A screen flashed the sight encompassed by his visio. What he heard, the Hostiles heard. What he saw, they also saw. They guided him now.

Something in his chest, where a heart would normally be, pulsed a warning of *Danger*.

They noted it, up in the ship, watching the street before him. He got orders. *Off the street. Dampness. Humidity count rising. Hurry.*

Yes. The legs moved slowly, and visio blurred a bit. And now he was nearing the place he was directed to find.

A large, brilliantly-lighted building. Signs out in front. He recorded, rather than read. **FIGHTS TONIGHT.**

Crowds, milling and pushing.

Don't touch anyone. Don't let them touch you.

He was to buy a *ticket*. Automatically, he knew what buying was, what tickets were, the entire procedure.

The voice came from inside, and he said, "One, please" and pushed the money forward.

The girl in the box-office (that was hard to comprehend, *box-office*: no data available on the term, but no matter) gave him a smile, a ticket, and some

change. It tinkled out of a slot and he stood there, waiting, until the communicator directed him to pick it up.

Then he went into the arena. Carefully, he avoided physical contact with the crowd. Somebody took his ticket, tore it in half, gave him a stub. Somebody else guided him to a seat.

Sit down. People were sitting down. That was a curious concept, although he understood. People had to *eat* and *drink* and *eliminate* and *sleep* and *rest*. Their bodies demanded constant care and accommodation. They sat down, they relaxed, they turned off part of their functions and turned on another.

That's what was wrong with people. They were imperfect. Not permanently functional. People became *sick* and had *accidents*, while he on the other hand operated perfectly. Eventually, all people *died*. But he wouldn't let anyone turn him off!

Yes, they were weak and imperfect and that is why people would be easy to overcome. The Hostiles knew. And his job was to corroborate by watching.

So he sat there and watched. The lights blazed in the ring, and the announcer bawled and the referee climbed through the ropes. And then two men, naked except for trunks, appeared in corners. (*Corners* in a *ring*—mathematical concept awry: no data. Just observe.)

He observed. He registered the howling of the humans around him. He registered shrieks and yells, and deep inside he registered the mass aura of the crowd.

The two men in the ring began to hit at one another with gloved hands. One of them started to bleed at the nose. *Blood* meant *injury*. And the crowd, with one great voice, yelled "Kill him!"

He knew what *kill* meant. It meant what the Hostiles would do when they took over. And here humanity paid money (which was valued) to watch two people attempt to kill each other.

He reacted and recorded as the fight went on. Up in the ship, they computed. And their computations reached him.

These were average specimens of mature human-kind. Old, young, male, female, rich, poor. And they were animals, suddenly swayed by fear, hate. Mass impulses gripped them completely. Mass reactions were easily registered. It would not be difficult to instill mass panic into such as these. So far the findings were favorable.

The fight was only in the second round (*round*—no data, apparently an arbitrary time-interval for this activity) when the signal came for him to leave.

He stood up and made his way out. It was hard to avoid contact with human knees and feet. Eyes stared at him curiously for a moment, then returned to the spectacle in the ring. From over the arena came the registered intensity of mass excitement, of hysteria, of illogical emotional reaction. It pleased them in the ship. But they were careful. They were going to check further. He had other duties to perform.

IT WAS STILL EARLY in the evening when the tall, blond young man came out on the street once more. The humidity count was not dangerous to the mechanisms operating inside the slotted skull. The mouth was closed, the nostril-openings protected, the artificial irises contracted. And the synthetic body moved perfectly.

Meanwhile, in the ship, his creators were calculating quickly and constantly upon the basis of his

observations. Mature adults, as they styled themselves, would not be a problem—if a fear-reaction could be properly provoked. There was one danger; an aggressive reaction might be aroused, and then there would be mass resistance. Plans were laid and co-ordinated accordingly. But mature adults constituted only a portion of humanity. There were many old people.

Old people—

He was being directed, now. Directed to the park. Here in the warmth of an early spring evening, people were strolling. And here was—*Danger!*

Just in time, the Hostiles caught it and he caught it. He stepped back from the sidewalk, flattened against the doorway of a building as the huge machine lumbered down the street, spraying water against the curbing.

Water-sprinkler. Avoid. Danger.

He was safe, again. He continued, turned into the park path. Old people were here.

Old people; lame, halt, blind. Aged and infirm. They huddled on benches, they stood and sat and shuffled around in the world of nothing-to-do-but-wait-for-the-end.

And many of them were clustered around the soap-box speaker near the deserted bandstand. He was pouring it on.

He stood close, but not too close. The phrases registered, although the meaning was not clear until the communicators sent along data. Something about "pension plan . . . can't earn a living . . . work hard all your life and die in poverty . . . wrong system . . . legislation . . . I'm old and you're old . . . what can we do?"

The speaker was old; old and ragged. He spoke with fervor, and the fervor was recorded. The crowd of elderly people reacted, and the reaction was recorded. The reaction was that of the two men in the washroom—it was *fear*.

That's what he was looking for—fear. And he felt it here. The old people, all of them, were afraid. Afraid of their future. Afraid of death. *Old people afraid* was duly registered.

And one hundred miles away, one hundred miles straight up, a sort of bodiless glee hummed inside the odd ship.

The Hostiles sent him walking on, then, down the street, into the bright lights. Then they put the most delicate of all devices into operation—selective recording apparatus that could beam in on individual passers-by.

It was a mechanical-chemical synthesis, it was telepathy and psychoanalysis combined, and raised to the highest power.

All kinds of people, thinking: *Wonder if I will get two weeks notice today for so much sick leave . . .*

God, but I'm sick and tired of working. Work, work, work . . .

Let's see, it's almost the first of the month. Time for the bills . . .

What will Peter say when he sees my new hat. He'll murder me . . .

Guess I'll stop in for a drink on the way home. I sure need one . . .

All shades of feelings and emotions. Boredom, fatigue, complacency, hope, chagrin, despair, panic, hysteria. And keening through all of it, in wave after wave—fear. Partial awareness, partial functioning, and all because of fear. Everywhere spread fear.

Up in the ship, they had data on fear, data gathered over many months, many years of observation. He wasn't the first spy. They were careful, because there would be only one chance to use weapons,

only one chance to strike. It must come, could come, at only the exactly proper moment. And the moment was—probably, almost certainly—now.

The data was reviewed, re-evaluated. Surprising data, some of it. Orson Welles . . . atomic bomb . . . communism . . . flying saucers . . . inflation . . . depression . . . war . . . strikes . . . incidence of psychotic disorder . . . juvenile delinquency . . .

The Hostiles checked that source now. Youth. He had another errand to perform. Plans were almost ready to go into operation, but there was this final survey to make. It would be made right now, tonight.

He clattered down the street. The neon lights reflected from his waxy, too-handsome face. His too-perfect features, his window-dummy smile seemed oddly artificial. But nobody noticed him. Humans took everything for granted; they were completely wrapped up in their own thoughts, their own fears.

Something began to hum, audibly, inside his chest, up near the shoulder-blades in the back.

The Hostiles caught it. He marched into an alley, groped into a dark, deserted araway. A cat saw him and suddenly arched its back, snarled and spat.

Animals were aware. They knew what he was. But that didn't matter. Animals would be destroyed, along with the human animals, when the Hostiles came.

He didn't wonder about what would happen when they came. He knew. They might assume bodies like his, for a while—because those bodies could easily function in the present mechanical pattern of this planet. But once the buildings came down, once the crude human-built machines were replaced by their products of science, old bodies would be discarded in favor of improved ones. He would be discarded, too, of course.

But it didn't matter. He felt no emotion concerning this, because they hadn't provided him with emotion. He could contemplate his own extinction with the same lack of reaction with which he contemplated, now, the extinction of two billion, four hundred and seventy-four million human beings and all their animals. Yes, animals, birds, reptiles and insects. (*Balance of Nature: data, an anthropomorphic myth. New pattern of survival already set up. Human and animal life unnecessary.*)

The cat howled and fled. He stood in the darkness and his hands opened the slot in his skull under the wig. A tiny wire had jarred loose. He adjusted it as directed. Everything was so delicate. The slightest jar, the slightest moisture might cause complete malfunction. Dangerous. But only one task more, now, and he could be safely discarded. The Hostiles would come. One task more.

The handsome young man walked out of the alley and headed for the Penny Arcade. It was out near the beach, on a pier.

It was noisy, very noisy. Inside the young man's head the machinery hummed, made minute, instantaneous adjustments in sonic reception.

The lights glared and dazzled. Visio accommodated to the glitter.

And he began to react and record.

This was the haunt of youth. The young people were all around; giggling, laughing, shouting, pushing, shoving. They draped across the counter of the soda-fountain. They put nickels into juke-boxes, dimes into automatic games, quarters into self-photographing booths. They riffled the pages of comic books and magazines.

He registered something on visio that caused the Hostiles to take heed. Some words about "science-fiction"

and a colored picture of a vessel. It was crude, but there was a vague, recognizable similarity between the unknown artist's concept and the actual vessel that poised one hundred miles above.

React and record. There was no fear here. Receptor mechanisms searched for it, but could not find it. Even out here in the arcade on the end of the pier, near the water. The rear of the arcade had a rickety balcony, and the dark water of the lake swirled directly below it. But these young people were not afraid.

Of course not; they were human, and humans did not dread moisture. But what about the other fears? Illness, poverty, death? The receptors searched.

No. Youth was not afraid.

UP IN THE SHIP they calculated. So many millions and so many millions in this particular age-group. Physical characteristics thus and so. Enough of a menace to forestall attack? Perhaps, if they were not afraid. But they were human, and the human is susceptible to panic. Particularly when confronted with surprise elements, with the unknown. Fear of the unknown. That might be the key. Investigate.

They sent him closer to the group at the end of the pier, at the magazine-stand. He stood there quite silently and inconspicuously.

All around him was the noisy neon fantasy of humanity at play. Below the pier was an amusement park where roller-coasters swooped and soared and shuddered down; where *papier-mâché* monsters goggled in the glitter of torchlight; where fantastically-costumed clowns and freaks grimaced at the crowds. Weird architecture, crazy lighting, and exhortations of barkers blended into a complete illusion of unreality.

And here, too, in the Penny Arcade, where the machines clanged, the air of unreality persisted. Teenagers in their curious costumes, milled and thronged. Their speech-pattern was oddly filled with "cool" and "extremely George" and the later neologisms.

So that he, standing there in his conservative suit, appeared quite normal in contrast—he was, in appearance, utterly real. He was real and the softly sounding waters without were real. There was a definite dampness in the air, and his vision blurred momentarily. Then the Hostiles made some adjustments.

The tall young man walked over toward the group of youngsters near the magazine-stand. Their conversation flowed casually, loudly, erratically. Their statements were positive, eager, exaggerated.

No fear. But no menace here, either. They were only children in the bodies of near-adults. Bobbysocks and blue-jeans and leather jackets and beanies formed a pattern of immaturity, of over-emotional self-dramatization.

"Here's a new one." A skinny lad held up the magazine with the space-ship on its cover. "Lend me a quarter, Marty. I want to buy this."

Marty wore glasses. He was trying to grow a mustache; a brave effort begun too soon. "Haven't got it, Dave."

Dave turned to the two girls. "Come on, you two—fork over! You owe me two bits from the ferris wheel. Make with the moola, Bea."

The taller of the two girls giggled. "Cool your heels! Ask Pat." The skinny youth went up to the shorter girl and pretended to talk out of the side of his mouth. "Come on, sister—let's have it." He grasped her arm, and she pulled away. His hand went to his jacket pocket, emerged.

For a moment the observer flinched. The youth had a *gun*. Like his *gun*. But no—the communicator estimated—it was only a toy.

Only a toy. They were children. They knew no fear, but in turn there was no need to fear them. Overgrown children.

Up above, they were satisfied.

The four young people scuffled good-naturedly before the magazine rack. The skinny boy still wanted his magazine. The taller girl protested. "You and your science-fiction! All you guys are gone on that kick. You have enough magazines!"

"But it's a new book. I want to see who's in it!"

"I'm weepin' for ya!" The magazine went back on the rack.

"Come on, let's see it." Marty grabbed at Dave's beanie and was threatened with the toy gun.

The spy watched, waited for the command to come; waited to turn away, his mission completed.

Instead, the communicator ordered him, "*Pick up the magazine.*"

He walked over, reached between the scufflers, took the magazine from its place. The Hostiles were curious. They wanted his visio to inspect the contents, see what puerile pseudo-science could possibly appeal to these immature minds.

"Hey, wait a minute, mister!" The taller girl, Bea, was protesting. "That's our magazine!"

"Yeah, it's ours. What's the score?" This from bespectacled Marty.

He did not find words, for words were not supplied. He reached in his pocket. *Pay for it. The cashier takes money, over there.*

He turned away without answering. He was quiet, his face was calm, there was no indication of concern.

The boy called Dave grabbed his arm. "Now, listen, Mister—give us back our magazine."

He was angry. All four of them were angry, and despite their previous scuffling, suddenly united. Something new was communicated to the receptors—determination.

A signal now came to the spy: *Don't answer. Go away. Quickly.*

But now Marty took hold of his arm. He had to get away, he had to move back. He stepped back cautiously, stopped as the four surrounded him. Dave was waving his little toy gun, and they were all yammering idiotically. Stupid human reactions, but he must be careful.

The message came. *Give them the magazine and get out.*

He raised his hand, extending the magazine. But Pat was excited, angry. She yelled, "Let him have it, Dave!"

And suddenly Dave leveled his ridiculous, childish weapon.

He pulled the trigger.

A stream of water shot out and hit the handsome young man in the face. It flooded his eyes, entered the opened mouth. He turned—everything was blurred—and as they laughed and shouted, another stream of water caught him squarely on the back of the neck. It saturated the wig, trickled through the slot.

Something flashed through the receptors but he lost contact. Moisture—dampness—wet—once you ceased to function it was forever! His damaged communicator sent out the same message he'd received from humans. He wasn't human, he was only a machine, but the message was plain.

Stark, utter fear.

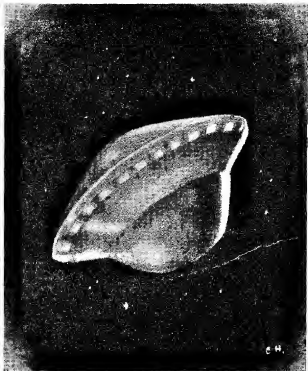
A hundred miles away, the Hostiles saw and sensed. In a moment the computations were revised,

conclusions drawn, a course of action chosen. They could attack, but youth would not fear them. And science or pseudo-science, somebody would discover the water weapon. No, this was not the time. Accept defeat and go. The curious vessel lifted suddenly, accelerated to incredible speed, was gone.

On the pier, the magazine slipped from a plastic-pneumatic grip. Instrument-hands rose to cover the dripping face.

The youngsters paid no attention. They bent and scrambled for the gaudy book, with no thought for the handsome young man. Their attention was easily diverted—humans were just like animals. Unconquerable animals.

He turned and staggered away. There was a peculiar lurch to his gait. He couldn't see. Drops of



"Up in the ship they calculated."

water were eating away inside his skull. Circuits disintegrated. Visio and sonic mingled in a roaring blur of vivid color and sound. Red noises and howling darkness.

If he could only wipe the droplets out of the slot, The Hostiles were gone. It was so hard to move! He tried. As he stumbled out of the Penny Arcade on to the railing walk of the pier's end, the youngsters caught one last glimpse of him; both hands raised and fumbling at the back of his head.

Then he was gone. They didn't see him hit the railing in his blindness, didn't hear the wood give way, didn't hear the splash as he—disordered, discarded machinery—tumbled into the obliterating waves below.

"What was the matter with him?" Dave asked. "I wouldn't of let him have it if I knew he'd take it so big."

"Aw, forget it!" Marty counseled. "So you made like Buck Rogers with a zap-gun and he got sore. Some people haven't got any sense of humor."

"Check," said Bea. "And people without a sense of humor aren't human!"

"Yeah," Pat sighed as they turned to open the magazine. "He looked like he was ready to blow his top!"

Schools have had, for many years, various forms of reading and aptitude tests, roughly categorized as "intelligence tests." The army has similar standard tests which aid in the proper placement of new recruits. It is even possible to spend the better part of a week at a place like Stevens Institute, taking an elaborate series of tests which, in analyzed composite, are claimed to measure the potentialities of the individual. In estimating the intelligence of monkeys, rice is placed in a box with a small hole cut in the side. The monkey can remove small quantities of rice without difficulty, but if he takes too great a handful he can remove neither hand nor rice. The animal's reaction to the problem gives a clue to his intelligence. Do you think you would pass an intelligence test given to you by a completely alien race?

Intelligence Test

by HARRY WALTON

(Illustrations by Seymour Chwast)



TWO MILES OUT OF TOWN on a main road, the lunch room drew trucking trade because there was plenty of space to park the huge trailer trucks. But there were none tonight, a hot night, sticky with the memory of a broiling day. A Sunday night, when there weren't many trucks out, and families were driving home to a cold supper and television.

Every time headlights swung around the curve of the highway, Schmidt raised his head with the last despairing energy of hope.

Like an automaton, the girl wiped a few dishes that were already dry. She was pretty in a way, and

might have been remarkably pretty if she had chosen to smile.

"Somebody will stop and help us, Daddy."

Schmidt, sitting on a stool at his own counter, shook his head.

"Kathie, maybe *nobody* will come . . . I want to pray, but I don't know—maybe this is something you should not pray about."

"For all we know, Daddy, it may have happened before. Maybe nobody ever heard about it because . . ."

The reason that occurred to her was not reassuring. Her father stared into the pool of coffee.



Harry Walton

Harry Walton is a science-fiction writer who unostentatiously writes science-fiction for relaxation, yet is important enough in his own right to be included in the 1953 edition of WHO'S WHO. A graduate of San Diego State College, where he majored in journalism, Walton was self-educated in the sciences. Today he is the mechanics and handicraft editor of famous *Popular Science Magazine*.

"It began after six," he murmured. "Just after you put gas in that blue roadster. Then when I wanted to go out to lock the pump . . ."

"That's only two hours ago, Daddy." And she added, with almost childish petulance, "If only the radio worked."

Her father drank the coffee as if seeking strength in it. "The tubes light, like always. But it doesn't play. It is as if we are in a bubble, a vacuum—"

The words shook her because they echoed her own sense, crystallizing the dread of the past hundred minutes.

Outside a pair of headlights swung off the road, rolled past the gas pump, and stopped. A car door clicked open and slammed shut. Inside, the two watched a man approach, tall, lanky, a human silhouette that might be old or young, handsome or ugly. The cardboard figure approached the door, and those within froze in an agony of anticipation.

The door was flung open, and the man stepped in, the screened panel slamming to behind him.

"You still open? Don't need any gas, but I could go for coffee, sinkers, maybe a sandwich."

He was young, and if not handsome, at least not ugly. He was like a gust of wind from an open plain. Kathie felt she could have kissed him just for being what he was—an everyday male.

She drew coffee from the urn, an enormous old-fashioned one much too big for the place. Her father stared at the man wordlessly. After Kathie had slid the coffee onto the counter, Schmidt got off the stool and went to the door. His daughter watched him with quick glances, so that the customer would not notice. But he did.

"You closing up? I won't keep you long. Just let me swallow this—and if you have a ham sandwich, I'll take it along."

At the door Schmidt turned away as if cringing under an invisible blow. She said mechanically, "Oh, we're open until midnight. Take your time. It won't matter—I mean, we live right here."

The customer nodded and started on the sandwich. Schmidt came back to the counter, shaking his head slightly as he climbed back on the stool. The man munched ham on rye, sipped coffee, and slid the cup back for a refill.

"Say, maybe you can help me. I'm with the Eagle. Know anything about that flying saucer story that started a couple days ago?"

"The one Mr. Wilcox saw?" Kathie asked.

"Sure. You know this Wilcox?"

"He eats here sometimes. If he says he saw something, I guess he did."

He finished the sandwich, unconscious of their stare. It struck him as he finished the second cup of coffee.

"Say, what's up? Have I got spots or something?"

The girl, managing a half smile, shook her head.

"Guess you wanted to close early. Sorry I kept you." He handed her a dollar, and she made change as if he were any other customer.

"Be seeing you," he said over his shoulder as he got to the door.

He fumbled for the handle of the screen door. Unable to find it, he pushed on the flimsy panel itself. He turned grinning.

"Okay, what's the gag? I knew something was funny when I came in. You've got shockproof glass in that doorway. I suppose the back door is nailed shut. What do you want, my dough?"

Jake Schmidt shook his head. The girl looked stunned.

"What sort of frame-up is this?" roared the man. Schmidt lay a veined hand on his shoulder.

"There is no frame-up. Do not talk like that to my daughter."

"Then you tell me. What's your racket?"

"It is no racket. It is worse—a disaster."

The girl came out and stood between them. "Let me, Daddy. Look here, Mister —"

"Ed Kelland."

"Look at this, Mr. Kelland."

She whipped a cover off a table, an oversize cloth that had hung almost to the floor. Then she dragged the table itself to one side. Kelland's brow puckered at sight of the thing that had been under it.

A cube about eighteen inches on a side, translucently opaque like a luminous china egg. A featureless geometric entity, floating in space a foot above the floor.

Kelland walked around it, stooped, and felt under it with a hand. He reached toward it, thought better of touching it, and substituted a pencil for his finger. The pencil stopped three inches from the cube. He pushed; the point shattered against nothingness.

Kelland faced the others. "Go ahead, tell me."

"There isn't much," said Kathie. "About six tonight I put gas in a car and came inside. My father was reading. Ten minutes later he decided to lock the gas pump. When he tried to get out of the door, he couldn't—and then we saw this thing."

"How did it get here?"

"I told you—it was simply here. Nobody—nothing came in the place after me. We don't know what it is, or why we can't leave the house. After a while we couldn't stand looking at—that thing. So we hid it with the table."

"You couldn't get out, but I came in . . ."

"If we had dreamed you could, we would have stopped you. Don't you see? We wanted somebody to come along, find us, and get help. Now you're trapped along with us."

The young man mopped his forehead with a rumpled handkerchief. "Now wait—this is pretty hard to swallow. How about the back door?"

"See for yourself. Through there."

Kelland looked at her, hesitated, and went through the door at the end of the counter. In less than a minute he came back, walked to an open window, and after a little tugging unhooked the screen. The warm darkness outside chirruped with insects.

The screen hit something solid when he tried to push it away. His outstretched arm flattened against a vertical wall—invisible, icy smooth.

Grinning ruefully, he replaced the screen. "Not that I thought you hadn't tried, but it's every man see for himself, in a case like this."

Schmidt nodded soberly. "We have not sat here idly. Every window is the same. There are only two doors—we have no cellar, no windows in the attic. The house is built on solid concrete—a slab. We could try to chop through. I have a heavy cleaver."

"Let's see it," said Kelland.

He took the thing from Schmidt and braced himself before the screen door. The big blade flashed down—and soundlessly thudded into the unseen barrier. Again and again Kelland swung it, his blows vigorous but ineffective. On the eighth he suddenly cried out and dropped the cleaver.

"The thing's hot! Don't touch it," he warned as the girl bent over. "It just seemed to sink into something soft but rock solid—if you can imagine that. On the last whack, it suddenly got too hot to hold."

He grinned, blew on his palm. "As a rescuer, I'm not so hot. What's your name?"

"Kathie Schmidt. My father's name is Jacob. I help him here evenings, but I go to State College day-times."

"How about the phone, Kathie?"

"We thought of it."

"Dead, huh? And you have no idea who or what could be doing this?"

Schmidt said wearily, "You ask who could do what cannot be done?"

Kelland shrugged. "If you had any idea—no matter how far-fetched. Otherwise you start with the unknown—an equation full of X's."

FLARING BRIGHTNESS swept the counter, the far wall, settled on the tables, and died a swift yellow death.

"Another car!" whispered the girl.

Kelland went to the door.

"I locked it," said Schmidt. "We must not trap anybody else, but try to send them for help."

The shadowy figure of a woman came hurrying up the walk. Through the glass panel of the door, light fell on her as she reached for the knob.

"Please let me in," she called shrilly. "I must make a phone call—it's important."

Kelland came alongside Schmidt. "The phone isn't working. We're in serious trouble. Get away and send the police."

"All I want is to make a telephone call. I simply must! Let me in—I'll pay you well for staying open five minutes longer."

"She probably could, too," muttered Kelland. "She's money."

Through the door the light gleamed on an evening dress, a fur stole, some jewelry, undoubtedly expensively real.

Schmidt repeated: "We are in trouble. The telephone does not work. Send the police."

Kelland could have sworn she stamped her feet without moving them. She came close to the glass and peered in.

"Unlock this door. Let me in!"

Incredibly, there appeared a small automatic in her hand.

"Hey!" Kelland murmured. "That thing could shoot through a door—even this one."

Confirming this, the gun spat. Something made a spider web of cracks in the glass, and whanged into a pot behind the counter.

"It is no use being killed by a foolish woman," muttered Schmidt. "But we must get the gun before she finds out—" And he turned the key.

The woman swept in, made straight for the phone, and took off the receiver with her left hand, the automatic still in her right. Kelland slouched over to her.

"Sorry," she said insincerely. "I was just desperate to reach a phone. Where is that operator?"

"Let me hold that," said Kelland easily. He gently took the gun. She flashed him a mechanical smile, and frowned into the unresponsive phone.

"We told you it was out of order," Kelland murmured.

"Drat! How far to the next one?"

"I don't know. It's not so simple, you see."

"You're not going to make a fuss about that shot? I have a permit." She opened her bag and held out her hand for the gun. Kelland shook his head.

"Later," he said.

"It's mine. I want it now. I'm leaving at once."

"Okay. But not with the gun."

Again that invisible stamp of her foot. She turned in a swish of skirt and made for the door, oblivious to the floating cube. Kelland, Schmidt and Kathie watched her in a mutual state of suspense. She threw the inner door open and reached for the screen door.

A minute later she turned panting, to glare at them.

"You'll pay for this. I demand you release me."

"Can't," said Kelland. "Like we told you, we're in trouble here. If you'd listened, you might have got us out."

Kathie stepped up and took her arm gently. "Come with me. We'll talk."

"Who wants to talk? This is practically kidnap—"

It was then her eyes fell on the cube. She looked from it to the others with the dawning of fear in her eyes. Then they fastened on the cube and did not leave it even while she followed Kathie dumbly into the back room.

"We are no farther along," said Schmidt when the men were alone.

"I wouldn't say that. We have this to experiment with." Kelland wagged the gun. "But that can wait until they get back."

He was on his second cigarette when they reappeared. The woman in the fur stole sat down on the farthest stool, her eyes averted from the cube.

Kelland crushed out his smoke. "Now look, maybe a bullet will get through this what-is-it. It mayn't do any good, but I'm going to try. At least the noise might make a car stop."

Nobody answered him. He waited until headlights approached, aimed the gun through the open door into the ground, and fired. The explosion thundered deafeningly in the little room.

At his feet, rolling off the door saddle, was an oblong little object with a wisp of smoke rising from it. Kelland picked the bullet up with his handkerchief. It felt hot even through the cloth, but it was not at all deformed.

"You know what? I think we learned something." Carefully he closed and locked the door.

"That not even a bullet can get out?" Schmidt shook his head. "That does not help us."

"Any information may help. This steel-jacketed bullet wouldn't mushroom like a lead one, but it would show some sign of ordinary impact if stopped at this range by anything harder than a bale of cotton. This thing isn't any form of matter as we know it. It's a force field. Wish I remembered my college physics."

"I do," said Kathie. "There was nothing like this."

"There is now. A field of flux in space, invisible but real enough to absorb kinetic energy by converting it to heat."

"I want to get out!" whispered the woman.

"So we have some kind of field forming a very effective matter trap. Why? Set by whom? Can we rule out the chance that it's a freak natural phenomena of some kind? Something that has happened before, unknown because the people who've been caught in it—"

"I really must go," murmured the woman in the evening gown, and suddenly dashed for the door. She turned the key before Kathie and Kelland came and drew her away. His eyes signaled to Kathie, and she took the other woman once more into the back room.

"Another go at that wall and we'd have had hysterics on our hands," muttered Kelland. "Now that we're alone, you'd better tell me."

"I do not know what you mean," said Schmidt.

"You do, but I don't—yet. Spill it."

Schmidt passed a hand over his face. "Not even Kathie did I tell. I was afraid she might think I—"

"After all this she wouldn't."

Schmidt drew a deep breath. "It was two nights ago—after Henry Wilcox told about the flying saucer and they laughed at him. Friday night. I locked the pump at eleven. There was a little moon, and some fog but not much. When I came back I saw it."

"Same as Wilcox saw?"

"Something like what he said. Something as big as the house, round or maybe egg shaped, hanging over it. The fog made it hard to see, but something—something I will swear was up there. It made no noise and had no lights, but it was there."

Kelland lit another cigarette. "You and Wilcox, then, saw something you can't describe. Doesn't help much, does it?" His gaze fell on the cube. "Seems logical that the force field starts from that thing. What if we could destroy it?"

"It is like the door and the windows," said Schmidt. "You cannot even touch it."

On one knee beside the cube, Kelland thrust his pocket knife at it. The blade scraped an invisible, glass-smooth surface. It was like trying to cut solid air. Kelland thought of the cleaver, but his earlier attempt with it promised little chance in that direction.

"Looks as if direct action is a blind alley in this case. They wouldn't leave anything vulnerable where we can get to it so easily. The thing could be—"

He stopped as Kathie appeared, alone. "I gave her a sleeping pill. She had them with her." She looked directly at Kelland. "What could it be? And why did you say 'they'?"

"Tell her what you saw," the reporter said to Schmidt, and the older man did so. Kathie looked inquiringly at Kelland.

"You know your father," he said. "Could he have—imagined it?"

"No."

"All right, let's assume he did see something. No machine we have could hover silently. A balloon would drift, unless anchored. So let's assume it was alien, out of this world."

The girl nodded tautly.

"Whoever was aboard it was interested in this place for some reason. Why? Why wouldn't beings from another world go to Washington, or the Aberdeen proving grounds, or even the copy room of the Associated Press, rather than a roadside lunch room?"

He ground out his half-smoked cigarette.

"As one wild guess, to try to fit the facts—suppose they want to know something about us before they go near those places or let on they're around? About Joe Doakes and Mary Jones. How we think, what we do in trouble. How Mr. and Mrs. Ordinary Earthman would react to something altogether outside their experience. Like this situation of ours. Mightn't they pick just a place like this, people like us, give us our emergency, and see what we do about it?"

Kelland looked squarely at Kathie.

"You think this is strictly from Buck Rogers?"

"No. Oh no."

Her father raised his hand. "And so—we can only wait."

"Not wait. Think!" Kelland snapped. "Think fast. If the alien theory is right, there's a way out."

"To escape?" asked Kathie. "But why?"

"Because they obviously aren't taking us anywhere. Because it must be simply an *intelligence test*. When we study animals, we set them a problem they should be able to solve. We tie bananas in a monkey's cage, out of climbing reach. Or put a rat in a maze, and food outside. But we leave a stick for the monkey to knock the bananas down with, and there's a way out of the maze if the rat will only find it."

NOBODY ANSWERED. Kelland went behind the counter, laid a newly lit cigarette on the edge of the gas range, and drew a glass of water from the tap. He drank slowly, watching the cigarette smoke spiral upward, trying to marshal his thoughts.

A knock on the door scattered them.

"We didn't lock it again!" he shouted, rushing from behind the counter. But the man was already inside, blinking a little in the glare of the fluorescents.

He was about five feet six, middle aged, dressed in flannels and a sport shirt. He looked embarrassed and vaguely as if he expected something unpleasant to happen.

"Sorry to bother you," he said. "My wife should be here—I spotted her car as I went by."

"Slender, good looking, wearing a fur cape over an evening dress?" asked Kelland.

"Yes. She is here, then?"

"She wasn't feeling well. She's lying down."

The man turned to Kathie. "Thank you. Will you tell her I've come to take her home?"

"She is in a very nervous state," said Kathie. "Wouldn't you care to wait a few minutes, while she rests a bit more?"

"Rests? You mean rot, don't you? Rot in this filthy little shack." The woman stood at the door beside the counter. "To think that I left two hours ago with big ideas—and landed here, with Charlie!"

"You were asleep, weren't you?" murmured Kathie.

"On one pill? It takes three these days, dearie. Why? Look at Charlie."

"I think we could all use some coffee," said Kathie desperately.

"He doesn't know it yet, does he? Poor Charlie."

"Doris! For heaven's sake—"

"Don't Doris me. Where's that coffee? I could stand some, if there's nothing better to drink. Coffee for all the monkeys in their cage." She stared mockingly at Kelland while Kathie put five steaming cups up on the counter, then perched herself on a stool, displaying more nylon than necessary.

"This is my husband, Charles Edding. Mr. and Mrs. Edding, of Southerton." She spoke to Kelland as if the others were not there. "All set now for the experiment, aren't we? Mr. and Mrs. Earthman, and friends."

"Doris, I'm afraid these people won't understand."

"Oh no, Charlie. As usual, it's you who don't understand. It'll be fun watching things dawn on you." She addressed Kelland again. "Charlie's treasurer of the Johnston plant at Southerton. Tells them whether they're making money, and how much they can spend. But he's still just a bookkeeper at heart, and that I can't stand."

"Doris, please—"

Kelland grabbed his coffee cup. "That'll do, Mrs. Edding. Better help us think this thing out instead."

She swung around on her stool. "Certainly. All the monkeys will now concentrate on their problem. Oh, stop shushing me, Charlie. These people are going to know our naked souls pretty soon, and you fuss about privacy. So I ran away from you for another man, but he stood me up and you found me. Wasn't that easy?"

Edding stared into his cup. Schmidt plodded over to the door, locked it carefully, and sat down at a table. Kathie brought him a cup of coffee, which he ignored.

At the counter, Doris turned as if against her will to stare at the levitated cube.

"Why don't you cover that thing up?" she asked. "It gives me the willies. Besides—"

She jerked upright, the cup falling from her fingers. The others saw her eyes freeze with terror, and following her stare, saw the cube pulse with a sudden, inward glow, swiftly blazing from soft silver to a stark and terrible whiteness.

Doris screamed. Kelland felt suddenly as if he had been clapped over both ears. In a low voice Edding spoke to his wife.

"Shut up!" she snapped. "It did something then—my ears popped as if I were coming down in a plane."

"I felt that too," said Kathie.

Doris turned to her husband. "Charlie, get me out of here. I'll go back with you—I'll stay. Only get me out of here right now."

"Of course, dear. Of course." He laid a dollar bill on the counter and turned. Kelland gripped his wrist.

"It isn't so simple. Your wife hasn't explained why she is upset, but that white thing is part of it—the lesser part."

"They've been holding me prisoner!" wailed Doris.

Edding stared from her to the cube to Kelland, who speedily explained. "Don't take my word for it—nobody could. Go and try it yourself."

As though sleepwalking, Edding went to the door. Four feet from it he cried out in pain and came to a stop, blood trickling from his nose.

Kelland rushed to his side, groped flat-handed in the air from the floor to arm's length over his head. Schmidt, from his seat by a table, cried out like a child.

"The cup! I cannot reach it—it is the other side."

He clawed frantically at nothingness over the table. Jumping on a chair, Kelland continued his exploration overhead. His fingers encountered a surface eight inches below the ceiling.

"Kathie, take the Eddings back and see where the barrier is on that side," Kelland ordered.

Doris clung hysterically to her husband as Kathie herded them both into the back room. Pulling out a fresh cigarette, Kelland remembered the sudden pressure on his ears, and threw it aside. They might need all the oxygen left.

Then Kathie was back. "It's three feet inside the windows now. What does it mean?"

"Means we have less room to move around in, and certainly less air to breathe. It also means," said Kelland, "that they've pulled the bananas a bit higher, given the maze a spin, to see what their test subjects will do."

"What can we do?"

"Don't know. I've been trying to remember something that Doris knocked out of my head. No, it was Charlie. I was standing by the stove."

"You got a drink of water."

"Yes, I remember thinking that water ran down

the drain all right. That could mean the barrier doesn't go below ground, but nor can we."

"You laid your cigarette down. I remember watching the smoke go up the ventilator."

THAT'S IT!" Kelland strode behind the counter again and stared up at a small, motor-driven fan set into a circular grille. "If the smoke got out—and it did—the barrier didn't close that grille. We had ventilation—the ventilator shoved air out, and fresh air came in the window. Now it's different. When they shrank the barrier, the fan was left outside."

To demonstrate, he climbed on a stool. His hand was stopped two feet from the ventilator.

"Whatever it is, the barrier shrinks from the outside in, compressing air ahead of it. With no way for it to get out, the air pressure in here must be slightly above that outside. That was why our ears popped, and why no more fresh air can get in."

"You mean we'll suffocate?"

"I suppose so, in time. But the point is, why did air get out before?"

"Through the grille?" asked Kathie. "It's nothing but a metal ring."

"Sure. A ring—a space completely enclosed by metal. Like the drain pipes. Maybe a ring detours the barrier. If so, couldn't you push stuff through the ring?"

Kathie stared as he pulled the gun from his pocket. "The gun barrel is a cylinder.—I wonder—a stretched-out ring."

He spread his left hand against the invisible wall before him, fingers apart. Into the V between thumb and forefinger he thrust the barrel. Kathie gasped as it slid an inch beyond his hand.

"See that? It slides through. I think the bullet would get out if I fired, but it's risky to try. If I'm wrong, the barrel would explode. What else have we got in the shape of a ring?"

"The bag holder in the coffee urn," said Kathie.

She took off the domed top and withdrew a nickel-plated hoop. From it dangled a sodden cloth bag. She emptied the coffee grounds and gave Kelland the bag. He knelt with it before the barrier. As he pushed the ring toward it, the bag was flattened. The top of the metal hoop struck solidly against empty space.

"It doesn't work!" Kathie cried.

"No, wait—got to hold it parallel to the barrier so that the whole ring makes contact." He did so, and felt it sink into that transparent impenetrability. Holding it in position with his fingers inside, he triumphantly pushed the bag through and pulled it back again. From his seat by the table Schmidt half rose in excitement.

"Convinced?" asked Kelland. "I think this is it. Now all we need is a ring big enough to crawl through."

Kathie shook her head. "But what can we use?"

Kelland looked about. "A screwdriver, first of all."

She gave him one from under the counter, and he pried up the metal molding from around the counter edge. It came off in an eight-foot strip.

"Nails," said Kelland. "And a hammer."

He rolled the strip into a ring, punched holes through the overlapping ends with a nail, and used two copper tacks as rivets to secure the improvised joint.

"Don't count on this," he warned.

Kathie helped him raise the flimsy ring and bring

it to the barrier. He swung it in position against the unseen wall. Sweat stood out on his forehead.

"It resists," he grunted. "Not much of a ring, really."

It sank into place suddenly. He gave a little shout of triumph, which changed almost at once into a cry of pain. As he jerked his hands away, the coiled strip fell inward, the riveted joint red hot. Kathie cried out, but a moment later brought butter to put on his smarting fingers.

"All the same, we're on the right track," muttered Kelland. "The field exists in planes, like walls, floors, and ceilings of a cube. But in that circular framework it acts like an ordinary, alternating-current field. It generates current in the ring. The current heats up that high-resistance joint. We need a better ring."

Edding came in. He looked curiously at the twisted metal strip. His forehead was beaded with sweat.

"What can I do?"

Kelland shook his head. "We don't know yet." "My wife has told you how things are with us," said Edding. "This thing has unsettled her, of course. But if I can get her home—the shock may have helped. We may be able to start afresh."

"We understand. But getting out is the problem."

"Can you estimate our chances of getting away soon? You see, there are reasons why it must be soon if we are to—"

The man took a fresh grip on himself. It was plain that he was under more tension than he had shown up to now.

"When I found the note she left, I did something I had planned a long time. I took company funds, a large sum I had taken home beforehand. I thought if I offered to go abroad with her, live her kind of life, she might stay with me. But now—"

"Now you could put it back, and go on here?" asked Kelland.

Edding nodded. "The auditors are due in the

morning. I must have been crazy. But if I could get it back tonight—" He smiled thinly. "There really isn't much hope of that, is there?"

"There is, if we can find a ring," answered Kelland. "A ring of metal, big enough to crawl through. That's Open Sesame to this trap. But so far all we have is this."

He waved the hoop from the coffee urn. As though it conjured an evil jinn, a second wave of compression stronger than the first smote their eardrums.

From the bedroom Doris screamed.

Edding was first to reach her. Close behind him, Kelland saw at once that there was nothing physically wrong with her, despite hysterical tears. But he found his way to the windows blocked five feet from them.

And behind him he heard Kathie's father cry out. Schmidt had come in too, but now he charged out of the bedroom as if possessed, to run into the next one. This was a small storage room holding canned goods, a few scraps of furniture, some garden tools, sacks of potatoes, and other miscellany. The barrier here also was several feet inside the wall. Schmidt hurled himself on it, sobbing incoherently as his hands tore at nothingness.

"Take it easy," said Kelland. "What are you after?"

At his touch the old man calmed down, trembling. "There—the ring we need."

"An old-fashioned tire rim!" shouted Kelland. "Of course."

It was the demountable kind common in the twenties, a hoop of steel without visible joint, virtually a one-piece ring. But now it was plain why Schmidt had clawed at the barrier. The rim was only five feet away—but on the other side.

"We have to get it," Kelland told Kathie. "One more compression wave and we may not be able to get into that room at all. But how?"

"Use this," said Kathie. "Fish through it with a pole—or a hoe."

She held out the coffee urn hoop Kelland had dropped.

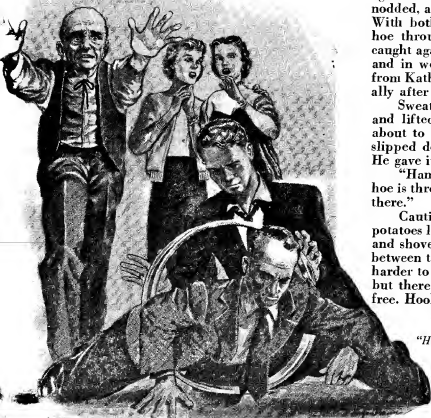
He took it, tore the bag off, and knelt to poise it against the invisible wall. When he felt it slip in, he nodded, and Kathie's hands replaced his on the hoop. With both hands, he maneuvered the blade of the hoe through the circle of metal. The sharp corner caught against the corner of a box beyond the barrier, and in working it free, the handle struck the hoop from Kathie's fingers. With a cry she lunged ineffectually after it.

Sweating profusely, Kelland tore the blade free and lifted it just as the ring, slithering down, was about to fall off. He raised the blade and the hoop slipped down the handle, back through the barrier. He gave it to Kathie.

"Hang onto it just in case. But now that the hoe is through, you can handle it as if the field weren't there."

Cautionally he hooked the blade over a sack of potatoes lying atop the tire rim, pulled the sack down, and shoved it out of the way. The rim itself, wedged between the wall and a full case of canned goods, was harder to manage. Nobody spoke as he nudged it out, but there was a gasp of relief when at last it rolled free. Hooking the hoe over its edge, Kelland swiftly

"He . . . thrust an arm and his head inside the rim, and crawled through."



dragged it toward him and in through the barrier.

Flushed with excitement, Kathie picked it up.

"YOU FIRST," Kelland told her. With the rim upright, he worked it into the field.

"Please, no." It was her father who held Kathie back. "We do not know what will happen to a human being who goes through. I will be first."

"Hadden't thought of that," admitted Kelland. "Okay, you hold the rim while I try it. Then I'll take over from outside."

"Wait." It was Edding who spoke up, now. "Listen to me, please. If anything goes wrong, the others will need you still. I couldn't take your place here. But I can go first."

In his eyes, Kelland read much he had not said, and a glance at Doris confirmed it. She was looking at her husband as if she had never seen him before.

"Of course," said the reporter. "If that's how you want it."

"Thanks," said Edding. He crouched, and before the others fully realized it, had thrust an arm and his head inside the rim, and crawled through. Forged in the days of large, high-pressure tires, the rim was big enough to make the feat easy. As if a little surprised by his own success, Edding stood and stared back at the others. Then he turned and walked, hands outstretched, to the rear door. Nothing hindered him as he stepped outside.

A moment later he was back, and Kelland read his expression once more. The reporter turned to Doris. "Your husband is waiting for you."

A sob escaped her. She went down in a flutter of fur, heedless of knees or nylons on the concrete floor. Edding took her hand as she came through, and helped her to her feet.

"Now you, Kathie," ordered Kelland. The rim was warm in his hands now, but not hot. Whatever energies it bypassed were apparently well within its capacity to handle.

The girl insisted on sending her father through first. She followed him, and, pausing beside the barrier, held the rim for Kelland to pass through.

The reporter hesitated. "Can't help thinking it's gone—" But when he explored the air outside the rim, he found the barrier still there. Only the steel ring formed an island of space in that sea of invisible substance. Kelland got down and crawled through as the others had. He felt no sensation to it, only a sense of anticlimax as, leaving the rim where it was, he and Kathie joined the others outdoors. In the warm, familiar darkness of a summer evening all that had gone before seemed fantastic and unreal.

"Thank you. We all owe you a great deal," said Edding.

His wife tugged at him. "Charlie, let's get out of here before it—before something else happens."

"Yes, you'd better go," Kelland agreed. "The others will ride in my car."

But as the Eddings left, he walked back toward the house. Kathie followed and watched him pick up the tire rim, her eyes somber in the moonlight.

"I can't believe it! It seems like a nightmare."

"Nightmares are only dangerous when they're real," returned Kelland. "Maybe we should find out. Can you drive?"

Surprised, she nodded.

"Here, take my keys. Get in my car and wait."

"I needn't know how to drive for that. What are you going to do."

"Take a look inside." He spoke much more casu-

ally than he felt, knowing all at once that nothing on earth, no prospect of danger or imminence of death, could be worse than fleeing the unknown. He must try to learn what more he could.

She must have understood, for she said no more, but led her father around the house to the car. Kelland entered again by the back door, carrying the tire rim with him. Turning, he found the barrier where it had been last. He fought down the impulse to get out again, and entered the counter room.

There also things were exactly as before. The white cube floated where he had first seen it. Was it still here, he wondered, to discover what he would do?

Still carrying the rim to insure his escape if the barrier should shrink further, he approached the thing closely. Was this the origin of the barrier? Or was it not only that but much more—a shield of force concealing a living thing, alert and observant behind that opaque, shimmering envelope?

Was the cube, then, a barrier within the barrier, a more concentrated field of the same nature as the larger one?

Had he stopped to think, Kelland might have hesitated. But on a sudden rash impulse, he swung the tire rim up, turned it flat with both hands, and dropped it squarely over the cube. For a moment of unbearable suspense, it seemed to him that time itself stood still while only his own heart pounded on.

Instead of falling, the rim floated an inch above the top of the cube. Immediately it became hot. Kelland stepped back, and the rim dropped another inch, while the smell of heated metal tainted the air. The white glare of the cube dimmed, as if its energies were being diverted. In seconds the tire rim glowed red, and the cube was shot with swirling darkness. Then as Kelland retreated, the cube moved.

It rose, or struggled to rise, as if against a weight too heavy for it. The tire rim rose with it, perfectly balanced as on a cushion of forces, a fiery white circle glistening with drops of molten metal. But the cube now moved as if with the last shuddering energy of exhaustion, as though whatever forces had been locked in it were spent, drained by the magic circle. Kelland had cast over it.

With a last flicker of pale light, the cube collapsed into darkness. The rim crashed to the floor. Something else fell also, something that lay inside the glowing ring, its pyre a circle of flames springing up from the floor.

Hastily Kelland drew a pail of water and poured it against the rim. Steam hissed up in a great cloud as the flames died. When the floor was thoroughly soaked and the white vapor dispersed, he saw clearly for the first time the thing inside the rim.

What its shape might once have been could now only be guessed. Scarcely a foot long, the tiny body was crushed in upon itself as if by a giant fist. Thin blue bones had broken through a translucent outer skin. What might have been limbs were misshapen and shriveled in death. But Kelland could tell it was not heat that had killed it, but something else. Something for which that fragile frame had never been fashioned. Something that would forever prevent its kind from usurping man's birthright.

It might explore the Earth as man explores the ocean's depths. But compete with mankind for its place in the sun, it never could.

"Air pressure!" murmured Kelland. "The cube was its diving bell. When that went, it was crushed."

No barrier hindered him as he walked out to the waiting car.

a short novel -

worlds in BALANCE

by f.l. wallace

In the detective field, Harry Stephen Keeler became known for a type of novel which employed "webwork" plotting. He would have many different, apparently unrelated events transpiring concurrently and create such a maze of situations that the reader would swear that there was no logic or unity to the whole, but always, at the end, all the pieces would fall carefully into place and the entire, over-all picture would become lucid. F. L. Wallace employs this technique to freshen the theme of interstellar civilization. Strong human elements and clever scientific ideas properly spice this complete novel.



F. L. Wallace

Mr. Wallace, an aircraft engineer during the past war, has at one time or another attended four universities without obtaining a formal degree. He has designed equipment for atomic oil exploration, gyro instruments, etc. He has taken strongly to writing science-fiction, which he has been reading since Gernsback's first publications.

(Illustrations by Tom O'Reilly)
(Jacket by Mance Albean)

"AFTER THE PICNIC we can drop hydrogen bombs on Merhaven," said Grandy. He brightened considerably at the thought.

Jason leaned back. "My father was born on Merhaven."

"Blood will tell," commented Grandy dourly.

"Maybe. But I should think you would have other outlets for your energy."

"We've always dropped bombs on Merhaven," Grandy said reasonably. "And so far they've always exploded them before the bombs got near enough to do any damage." He added with philosophical conviction: "One of these days our luck will change."

Strange, Jason thought, how the centuries had destroyed a great dream. When the first interstellar expedition had reached the Alpha-Centauri binary system, three planets had been discovered, each miraculously adapted for human occupation. Further, the three planets were close enough to offer favorable conditions for trade. The original pioneers had envisioned the establishment of a planetary bloc, almost utopian in character, as compared to the persistent strife of the home solar system. No one seemed to know when it had started or why, but now Kransi, the second planet, battled almost incessantly with Merhaven, the third, while Restap, the first, acted as a sort of middle man, benefiting from the strife that impoverished its companions.

It was their quarrel, and it wasn't for him to change them. "But what do you gain?" asked Jason. "I suppose they're decent people, and even if they aren't, you have no business making a sneak attack on a whole planet."

"Hah," snorted his granduncle, fiddling with the slender cylinder in his hand. "Have you ever met a Merhavian?"

"You should know. My father was one."

"So he was," said Grandy suspiciously. A frown creased his forehead and thought processes became almost visible under his pink skin. The creases climbed slowly up his naked scalp and disappeared somewhere behind his skull. "But your mother was Kransian, and therefore, so are you—that's all that matters," he said, relieved at the conclusion. "Many's the time I've dandled her on my knee when she was so high. She was a darling tyke." He passed his forearm over his eyes.

That was pure self-deception, decided Jason. Grandy had never been the dandling type, unless the girl was eighteen or so—and buxom. And after this many years, his grief wasn't convincing. Guilt might account for the display, of course. The people of Kransi had been none too kind while she was living. For reasons they alone understood, they had imposed a form of exile; she was welcome back, but not with her husband. They had forgotten about that, now, in their clannish sentimentality.

He looked up to see that his granduncle had discarded the grief, real or imagined. Grandy pressed a cigarette into the cylinder, inhaled deeply, and exhaled with equal vigor. He twirled the holder

and shaped the smoke at a distance into a cube that hung motionless in mid-air.

"Isn't that bad?" asked Jason. "I thought the smoking habit had died out long ago."

"Bad habit?" Grandy challenged. "Sure. We've got lots of them. They're good for you." He twiddled the holder, and the smoke cube broke up and reformed into the familiar torus. He inhaled again and shaped the resulting smoke into a form that left no doubt as to what sex it represented. The smoke ring was still there, like a halo, except it was over the girl's head. The girl and the halo floated to the ceiling as Grandy manipulated the holder.

"We've made improvements," said Grandy. "It used to be that no one could waste more than ten minutes with a cigarette. Now I can kill a whole afternoon." The smoke girl wriggled.

Jason turned away. "About the picnic—"

Grandy sniffed out the cigarette and put the holder away. The girl floated to the ventilator and dissolved. "We've got it all planned. Naturally you'll come to Kransi; you've never been there, and you'll want to see how green it is. We'll spend most of the time on the main continent because most of the family's there. After that, we'll go to the smaller continents and islands—"

"I'm afraid not," interrupted Jason. "I'm on Restap for business reasons. If you want a picnic, you'll have it here or not at all." His business was unimportant; normally it would have been handled in a routine manner by his organization. But Restap was a convenient stopping place, and he was curious about Kransi, though not enough to go out of his way.

"Restap on business?" said Grandy. His face was completely hairless, but the line where eyebrows would normally have grown arched high on his scalp. "Why Restap? Is Earth in trouble?"

"Of course not," said Jason. "What does that have to do with it?"

"You'll see," said Grandy mysteriously. His face was a study of contemplative introspection, or what passed for it on his features, but he was not concerned with Jason's worries. He turned his attention to more important matters. "But if we have the picnic here only a few can come."

"That's enough," said Jason firmly.

"Your family will be disappointed," said Grandy sadly.

Jason carefully refrained from asking just what constituted the family unit on Kransi. "I'll charter a ship," he said. "That should be big enough to bring those who really want to come."

"A Restapan ship?" queried Grandy.

"Don't you like them either?"

"On Restap I love them," said Grandy. "Back on Kransi I'm not so sure." He shrugged indifferently. "Still, we have to trade with someone."

Jason gave up trying to understand the cryptic old man. "Charter a Kransian ship then," he said. "Bring them here and take them back. Send the bill to me."

Grandy looked thoughtful. "Can you afford it?" he asked. "Will it interfere with your duties?"

"It won't interfere," said Jason. "And I think I can afford it." Grandy's concept of wealth was quite primitive; it was best not to enlighten him.

"Then it's an honor to accept," said Grandy. His manner was grave, and although there were centuries of custom behind his leave-taking, it was quite brief.

After Grandy was gone, Jason leaned back. An

honor, the old man had said, and meant it. What was an honor, and why? And what were the duties Grandy had alluded to? The answer probably lay buried in the culture. Unfortunately, Jason knew little about Kransi. His mother was Kransian, but she had died when he was five. In his mind there was a memory that was only an increment above pure emotion—his mother talking about her homeland. The sound of her voice was there, but the words he had forgotten and the content he could not recall.

Jason shifted his attention to the present. He was passing through Restap, that was all. It was not surprising that Grandy should learn of his presence; Kransi traded with Restap, too, and no one could miss his space ship, sleek and glittering, in the spaceport outside the city.

He didn't want to get involved. He owed them nothing except resentment, although now less than before, and he was willing to discard it altogether. He knew clearly what he should do: accept their friendliness with reserve, attend, briefly, the customary picnic, and then, cut off contact with them as soon as possible. Still, they were more interesting than he had anticipated. Bloodthirsty and thoughtlessly vengeful, they were also illogically charming. Nothing mystical, he was sure of that, but he was all the more curious because he couldn't characterize their attractiveness.

Jason shook his head puzzledly. The conflict between Kransi and Merhaven was not formal. It didn't involve armies and organized war fleets. But as individuals, neither side needed a declaration; they simply fought at every opportunity. It didn't make sense—but a lot of things didn't. He had asked Grandy about it, but the old man had been unable to enlighten him. It had started in the remote past and, it would continue into the equally distant future. Nothing could be done. But there must be *one* answer, and Jason could investigate it without committing himself.

Jason placed a call, and after a long interval, Secretary Moffle, of Restap Intrade, appeared on the screen.

Secretary Moffle was a smiling man and his teeth were splendid. He showed them all. "What can I do for you today?"

"I need a technician. Can you give him clearance to work on my ship?"

Before Moffle could answer, Grandy returned. He peered into the room and shouted, "Carlos has no place to stay."

Jason looked up in irritation. "Never heard of Carlos," he said. His ears were ringing.

Grandy shuffled into the room. His clothing didn't quite fit, and he clutched his pants determinedly around his middle. "Your cousin. Do you have a place for cousin Carlos to stay?"

Jason started to shake his head and then thought the better of it. "Send Carlos over," he said resignedly. "I'll find a place." Grandy disappeared.

When Jason turned back to the screen, Secretary Moffle was waiting, smile, teeth, and all. "What kind of a technician?" asked Moffle.

"A computer-man," said Jason cautiously. "A good one."

The secretary was crisp and businesslike, but not unnecessarily so. "That can be arranged. You'll have to sign for it of course."

"Be right over," said Jason, and though the secretary protested such haste wasn't required, he prepared to leave. There were many ways of getting information.



"Jason set the dial, fed in the data . . ."

JASON EXAMINED the machine. It was a computer—a psychocomputer, called an Electronic Advisor—although not the kind a Restapan would be familiar with. Still, the technician seemed to have done a good job of reconditioning after its long period of disuse. The test would be whether it would function or fail to work.

Jason set the dial, fed in the data, and the machine warmed up. Finally, it answered. "The data have been filed in the circuits," said the Electronic Advisor.

"Good," said Jason. "What's your conclusion?"

"None possible. Not enough information," said the machine. The dial had been set at FRIEND and the voice that emitted from the machine was therefore friendly. "I suggest you submit additional facts."

Jason frowned. It was his first experience with an Electronic Advisor, though his father apparently had used it often. It wasn't promising. If he only wanted a pleasant voice, he could find many humans who would suit his purpose as well. "But that's all there is," he said. "I've checked every reference to Kransi and Merhaven."

The machine accepted it. "Have you gone to Restap Intrade?" continued the machine, colloquially. "Both planets contact Restap periodically, though they're careful not to appear at the same time. I'm sure Intrade can add to your knowledge."

"They can. But they consider their information a commercial secret. They are not anxious to share what they know about either planet."

"Then I can't answer the question in a way you'll accept. Still, according to my understanding of humans, it's very logical."

"Let's hear it," Jason said. "I've grown up on Earth and consider myself an Earthman. It won't affect me personally."

"Xenophobia," said the Electronic Advisor. "Hatred of foreigners."

It was a classical answer. Because the stranger was different and his potentialities were unknown, they feared him. And fear didn't exist by itself for long—it brought hatred with it. When both appeared, conflict was not far behind.

Perhaps there were situations in which that was sufficient cause. It didn't seem to apply to Kransi and Merhaven. Neither of them were aggressive in the imperialistic sense, and since they were separated by millions of miles, there was no real occasion for them to meet. If xenophobia were the cause of their war, there were many alien life forms much closer at hand for them to fight. They were relatively at peace with the non-humans, who occupied their various planets.

"Look again," said Jason. "Try the economic level. Somewhere they're at cross purposes, though they may not realize it. Or perhaps it's historical.

There may have been an original incident, forgotten by now."

"I can shuffle facts far faster than you can, and I've put them together in all possible ways. As far as trade is concerned, neither Kransi nor Merhaven do much trading. What the principal items of commerce are, I don't know."

"Historically speaking, the incidents have been all of one kind: *violent*. No one can say who started it. Both sides seem to be responsible."

"Get me facts and I can evaluate the situation."

With all the facts a computer would not be necessary. He had expected from the Electronic Advisor a flash of understanding, and it wasn't forthcoming.

The information he had was all he could get without difficulty. He could hire experts and send them to Kransi and Merhaven, but he could only depend on Earthmen. Any Earthman, whether a culturologist, economist, statistician, psychologist, or politologist, would be met at the spaceport, politely it was true, returned to the ship, and promptly sent back. Thus they received most visitors, and that was why so little was known.

"There is another source," said the Electronic Advisor. "You can make it available if you will."

"If I will," repeated Jason, jarred out of his thoughts. "What's that source?"

"You," said the machine.

"I won't get much," said Jason. "I've told you who my parents were. Beyond that I can't go."

"I understand about Kransi. Your mother died when you were young. But your father lived until you were twenty; that was seven years ago. Surely he told you something about Merhaven."

"I seldom saw him, and only for a few minutes at a time. He was a semi-invalid, and he had business interests to look after, but he took care of them from this ship. I know less about Merhaven than about Kransi."

The Electronic Advisor was silent. "Now I begin to understand. You never had family contact. Your father was a business man, a phenomenally successful one. In twenty years he piled up a fortune larger than anyone has ever made in a similar period of time."

"Not an outstanding concentration of wealth of course, and it doesn't begin to compare with certain financial dynasties that have been established for centuries. Nevertheless, because he was busy making money, he never had time to spare for you. I can see—"

"What you see in that direction doesn't interest me," said Jason. "My motives are my own concern. I don't need a psych job of any kind. Is that clear?"

"Very clear," said the machine.

"Further," said Jason, "you're overlooking an even better source of information. Think about it."

"I've thought," said the machine in a fraction of a second. "If I have permission to examine the record circuits?"

"You do," said Jason, looking at the dial settings. MISTRESS, SELF, FRIEND, LAWYER, PSYCHIATRIST, SPOUSE. "All of them, regardless of category."

"Does it help to know that the psychocomputer he installed in his ship, yours now, is a standard model?" asked the Electronic Advisor. "The dial markings are conventional, and he left them that way, though he used only two. One of them was FRIEND."

"What was the other?" asked Jason in spite of himself.

"SELF," said the Advisor. "But he didn't use it

that way. He had it recircuited to GENERAL CONVERSATION."

The machine was probing further than Jason cared to go. "Why was that?" he asked uneasily.

"He was a lonely man," said the machine. Then it was silent, searching through the circuits that comprised its memory.

Jason waited while seconds became minutes. At last the Electronic Advisor reported. "The records are not available." Was there a trace of surprise in that voice?

"Lost? Completely destroyed?" He hadn't expected much, but it was unpleasant to learn that the records were gone and with them the remainder of the man who had been his father.

"I didn't say that. They're still there, but the circuits have been locked. On Earth there are technicians who can open them. Nowhere else, I'm afraid."

It would take far too long to get to Earth. "How did it happen?" asked Jason.

Again the machine searched its memory. "The technician from Restap Intrade," it said, "tinkered where he shouldn't have. It may have been accidental."

And then it may not have been accidental.

Jason smiled with gloomy confidence. His father had been an exceptional entrepreneur, and his son was not inferior. He could take care of himself in that area. And it gave him an idea. If he were so important to them, he might find ways to pry information directly from Intrade. He could try.

He left the ship, went back to the hotel, and soon fell asleep.

IN THE MORNING, sunlight streamed through the window awakening him. He opened one eye. It wasn't real sunlight, merely a good, electronic imitation that blanched the window. Anyway, it was morning. He yawned and stretched out his arms. At the extremity of his reach he touched something. Whatever it was, it wasn't the bed. He wagged his fingers. Flesh.

He opened the other eye and rolled over. An incredible pixie face reposed on the far corner. Jason grumbled to himself; if this was a Restapan custom, he didn't like it. He got out of bed and roughly jerked the covers off the sleeping man. Quite as promptly, he put them back, because he found it was not a man.

The girl awakened instantly, without a transition period of drowsiness. "Good morning," she said cheerfully.

"What are you doing here?" he growled.

"Sleeping," she said. "But you didn't sleep well. I can tell." She looked at him sympathetically.

"I slept all right." He caught himself speaking gently and changed back to gruffness. "How did you get in here? What's your name?"

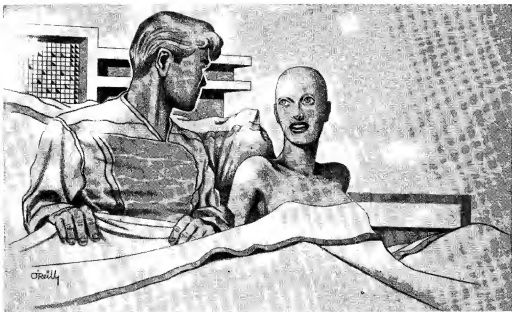
"If you want names, I've got lots of them," she said. "But if you want to know who I am, I'm Carlos."

So that was it. Grandy should have told him. He looked at Carlos' face. Not a hair on her head, not an eyebrow nor eyelash. In spite of that she was pretty, in a peeled sort of way. "But why did you sleep here?"

"I didn't want to disturb you when I came in," she said meekly. "And it's such a big bed."

"Not big enough for you and me," he said firmly. "You should have found another place."

"An incredible pixie face
reposed on the far corner."



"Not big enough!" she exclaimed, looking over the vast expanse. "Can't you lie still?"

"That's none of your business," he said with dignity. "Get up and put on some clothes."

"Who wears clothes?" she said wonderingly and stared at him. "You're only half Kransian. You wear them, I suppose."

He clutched at the bed and wrapped something around him. "Do something," he insisted.

Obligingly she got out of bed. She was a small person, but nonetheless womanly, in spite of her size. Her skin was as smooth as an apple, buffed to a faint golden tan. "What colors are you wearing today?" she inquired.

"Then you will put on something?" he said, retreating across the room.

"Oh sure," she said. "Not clothes though. No Kransian wears them, until he's as old as Grandy, and has to." She tossed her head and picked up a small container he hadn't noticed before. Leisuredly she wandered into the next room.

Hastily Jason dressed. By the time he finished Carlos came back. It didn't pay to trust his eyes! For now she had hair, black hair that curled close to her head; her eyebrows and lashes were full and natural, not painted on. As for the rest, she was decently covered, so she could walk through any city on Earth, not without attracting attention, but still without falling foul of the legal limits of decency. He looked again. Or could she?

"All right," he said. "How did you do it?"

"You didn't tell me what color," she said. "And since black goes with most anything I thought—"

"Not the color," he said. "The hair on your head, and I guess you can call it a fur bathing suit." It was more like fur than anything else, and it was one piece, one with the rest of her body.

"Well," she answered. "We don't like to wear dead things, plants, animals, or the synthetic stuff that comes out of vats. So we use *goop*."

"Goop?"

She sighed. "It has another name and I can write it out for you. But it covers pages, and only a biochemist can begin to understand what it means, and he couldn't make it." She added politely. "We keep the formula a secret."

They would of course; anything like that was valuable. It was a neohormone probably, a synthetic

substance that never existed in nature and was better than any comparable natural substance. With it, they could grow hair to any length, color, or texture in a matter of minutes, simply by applying the proper mixture to the skin. Most likely the substance contained nutrients so to supply the body cells with the material for growth. They put it on in the morning and they were clothed. At night they applied a counteragent and it came off. As Carlos had indicated, eventually the body became too old to respond. When that occurred, the old person had to wear conventional clothing, belts, buckles, snaps and fasteners, uncomfortable to one unaccustomed to it. There was no such a thing as a natural blonde or brunette on Kransi. Everyone had his choice; green, if he liked the color today, tomorrow, blue.

"It's impolite to stare," said Carlos. "Especially when your guest is hungry."

He showed her the menu selector and watched her use it. He sat on the opposite side of the table: food slid out of the slot and she ate it as it came, daintily and absentmindedly, but with unflinching appetite.

He questioned her on the customs of Kransi. She was his cousin, she told him, Kransi style. Five hundred years ago, give or take, someone from his mother's side had married someone from her father's side. The family connection was now growing a bit remote though, and unless it were renewed in this or the following generation, the family ties would then cease to exist.

He received the information silently. That was Grandy's game; he should have expected it, but somehow he hadn't. He just didn't associate that kind of an attitude with such gentle people. And they were gentle with those inside their group, he thought, no matter how fiercely they fought those outside it.

"You're not very clever," he said. "I have no intention of marrying you."

Carlos looked up. "Haven't asked you yet," she said through a mouthful of food.

Apparently, that was another Kransian custom. He ignored it. "I'll get you another place to stay. You can make your pitch for money at the picnic."

"Money?" said Carlos, still eating. "Who has money?"

"I do," he said savagely. "And I don't like people who scheme to get it. Don't you think I can

see what you're trying to do?" He looked at her contemptuously and her considerable attraction vanished, and she became merely a pretty girl, willing to sell herself to escape the poverty of Kransi.

Carlos swallowed the last bite. "You poor thing," she said. "Do you have to have so many things that you need money to buy them?"

She was infuriating and he couldn't help shouting. "Yes I do. Everybody does. How do I get the food I eat and the clothing I wear—" He stopped shouting. The clothing he wore! Her needs on that score were simple. A tube of goop might last for a year, providing her with every style change she could want, one each day according to her mood. There was nothing like it on Earth, or elsewhere. And it might be the same with food. There were other things humans needed, but Kransi might have answers for them too.

He lowered his voice. "The picnic is for me, isn't it?"

She nodded.

He got up and walked nervously across the room. "You know that I'm very wealthy?"

She shook her head. "We didn't."

There was no reason to believe her, and yet it might be true. Kransi was isolated, and maybe the news hadn't penetrated that far. They would be indifferent to matters of importance.

"Then what is it?" he asked. "If it's not money, why are you going to all this trouble?"

"You're a very important man," she said. "No one on Kransi has ever been invited to join the organization on any level. They don't think we're suited I guess. Anyway, here you are president of Amity."

He sat down. Amity. What the hell was Amity? Vaguely he remembered. He had taken over his father's business and run it as well as anyone could. There were always charitable groups which were appealing for contributions. One such group had been Amity. Not Amity, Inc., or anything like that, just plain Amity, a half-baked, idealistic institution dedicated to extending peace throughout the galaxy.

As a matter of policy he had made a contribution to Amity, tax deductible. It was more than they had expected, probably more than they had ever received in a lump sum. It hadn't meant anything to him, but it meant a great deal to them, and they had responded by making him their president. The title was strictly honorary. He had forgotten about it, but Kransi hadn't; and he was therefore important in their opinion—not because of the wealth at his command, the power he wielded. It indicated a lot. They were warlike, if any people were. Their special enemy was Merhaven, but if the occasion arose they were willing to tackle any other foe. There was only one exception; they had never fought Restap. But aside from that, they waged war easily and cheerfully, with ferocious grace and clan.

But actually they wanted peace, if only someone could tell them how to achieve it. He grinned at Carlos. He wanted peace too, and he suddenly felt he belonged to Kransi. He was tall, and in that, he resembled his father. He picked up Carlos in his arms. "Keep the plans for the picnic working," he said. "I'll be back." He kissed the crumbs on her lips and sat her on the table and left.

THE SPACE SHIP decelerated, and the lurch awakened Jason. He wandered to the screen, snapped it on, and began examining the planet. He was soon going to learn whether his idea was any good.

Mishshrouded and rugged, Merhaven possessed a craggy sort of beauty. Covered largely by mountains that were not high, the terrain nevertheless took the hard way up from the shores of the seas to the tops of the tallest mountains. The higher plateaus were overrun with a thorny growth, and here and there were patches of flowers. If there were a unity between character and geography, it was easy to see that his father had been born there.

The valleys of the planet—but he didn't have time to reach a visual conclusion as to what the valleys were like. The screen whitened in front of him. Instinctively he closed his eyes, and the filters cut the intensity of light before it could blind him. He staggered against the panel and pulled down the squawker. Whether or not the men in the patrol stations received his identification signal, he couldn't determine. The ship shuddered from another near miss.

By this time he could see again; not well, but he could see. The instruments registered another uncomfortable close detonation. They didn't care how much ammunition they used on him. He slipped the ship into an automatic, falling-leaf pattern and let it rush toward the planet. At the edge of the atmosphere the attacks ceased, as he expected. They wanted to eliminate him, but they would rather not breathe radioactives. And nothing less than their big stuff could bother the ship.

He found his bearings and limped along over the Merhavian continents, molested no further. He found the place he was seeking, an upland valley not far from a small settlement. As nearly as he could tell, Merhaven was decentralized, with no large cities. He set the ship down on the side of the valley.

A weatherbeaten man came out of a rambling house at the forefront of a cluster of buildings a half mile away. It was impossible to guess his age; he may have been old, for his cheeks were eroded like the crumbling granite cliffs that guarded the valley. The old man covered the distance in a short time and stood with tight lips, surveying the damage to the ship, the fused plates and the battered prow.

The old man turned as Jason left the ship. His eyes were grave. "Welcome home, laddie," said his grandfather.

JASON COULD NOT name what he ate, but, although there was no great variety, the food was satisfying. His grandfather sat across the table, watching in silence. After an interval he pressed a button; the table buzzed, shook, trundled across the floor, made a right turn, and disappeared into the next room.

Still in silence his grandfather looked out of the window. "We are not good technicians," he said finally. "But we can repair your ship so it will take you safely back."

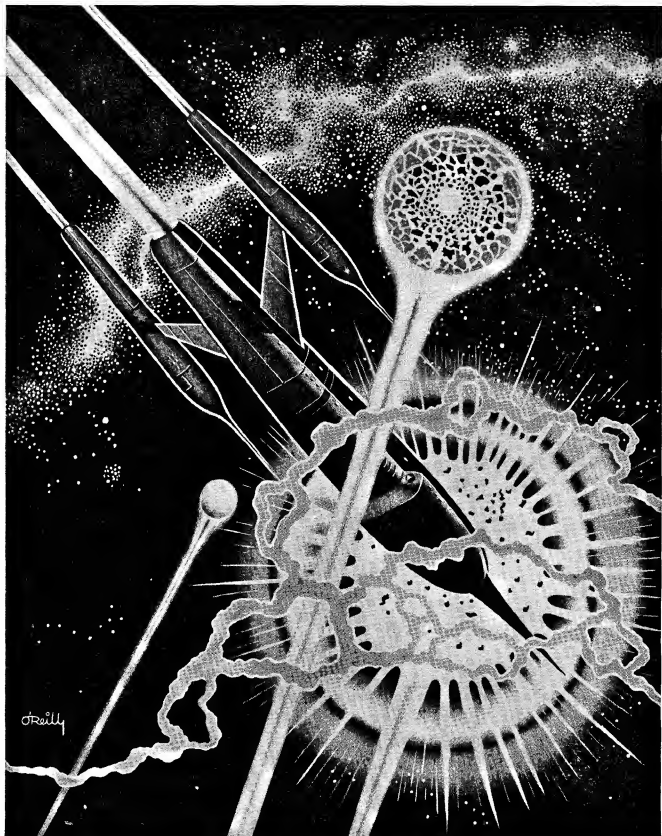
Jason flushed. He hadn't mentioned going back; he'd hardly said anything. Evidently it was assumed he wouldn't want to stay. "I'll get it fixed up on Restap," he said.

"We are poor workmen," said his grandfather, his ancient jaws twitching. "But not *that* poor. It's not safe to be traveling at all in a ship so battered."

Mentally Jason shrugged. Neither was it safe to trust a ship to unskilled hands! But it didn't seem advisable to mention that. "Did you get the message?" he asked.

"That I did."

"Then why did they fire at me? They should



"The ship shuddered from another near miss."

have been able to identify the ship. It isn't common, you know." That was an understatement. Not even a novice could mistake it for something from Kransi.

"I don't know, laddie," his grandfather sighed heavily. "I'm merely a private citizen."

It was true, but it didn't tell the whole story. On this loosely-governed planet he was a citizen of considerable influence and prestige. The message had to be cleared through a government station, and therefore the planet patrol had been forewarned

that he was coming. They knew who he was but that hadn't stopped the attack.

Again a long pause. "I will inquire," said his grandfather.

Jason let the subject drop. He was pretty certain where the inquiry would lead—nowhere. The most he could expect was an official apology. Someone had a reason for wanting him out of the way. As far as he could see there were only two forces—Kransi and Merhaven.

Kransi wasn't likely. He'd come on the spur of the moment and told no one where he was going. The message hadn't been sent until he was in full flight, and since it had got through, it positively hadn't been intercepted at any intermediate point. The government of Kransi would have had to do some fast plotting, even assuming they had relied on guesstwork to determine his destination.

But the big argument against Kransi could be stated more simply. Merhaven was not likely to co-operate with Kransi on anything. Therefore Merhaven wanted him out of the way! And what that implied he didn't know. He was not a Merhavian, but his father had been, and in their eyes that was enough. In his mind Jason saw the screen again, whitening before his eyes. Perhaps the kinship angle was not as strong as he had thought.

His grandfather arose, agile and strong in spite of his years. He was dour and taciturn, but he was also a sincere man. "Come laddie, I will show you Merhaven."

Jason walked out with him. Across the valley workmen were climbing in and on his ship. His grandfather had not waited for permission to begin repairs. In any event, it was too late for protest.

Jason headed toward the landing field.

"Not there," said the old man, catching his arm. "We'll walk."

"Walk over Merhaven? It's pretty big."

"You'll see nothing elsewhere that you'll not find on my place."

"But won't it be easier if we take one of the little skimmers?"

"They're not in good condition. You're not safe in them."

The remark didn't need much interpretation. In the sky he would be an excellent target. Even the presence of his grandfather wouldn't save him. They hadn't stopped trying.

Who were "they"?

Jason stepped closer to the old man and kept behind him as they climbed laboriously and silently up the nearest mountain. An hour passed as they ascended, and then another half hour. When they reached the top they paused and looked around. Jason was tall, but the other was taller.

"This is the world your father left. He would want you to see it."

Jason shaded his eyes. A cloud hung on a mountain peak to the left and a brook sparkled below in the sunlight. There was nothing but bare rock where he stood; elsewhere there were masses of purple flowers.

"It is a beautiful world," said his grandfather in answer to the comment that his grandson felt but did not say. "We like it, but it gives us little in the way of a living. It will grow flowers, but not food." His grandfather turned away. "We are inadequate business men. Were we otherwise, our life would be better. Two thousand years ago the planet was settled because it was rich in uranium. At that time uranium was used to drive ships and everyone wanted it. But new fuels were discovered and uranium is no longer used—not for any purpose. Today it is difficult to give away uranium, although it is the only mineral we have in abundance."

Jason nodded; that was to be expected with an economy based on a single product. When the demand for that fell off, there was nothing else.

"We've tried our hand at manufacture," continued the old man. "We make little items that do not require much material, but our products are in-

ferior and do not find a ready sale. Still, we have to continue because we need food." He pointed to the floor of the valley. "See."

Jason looked; there was a spot of intense green, but he couldn't make out details.

"That little place grows more food than all the land around you," said his grandfather. "There is a chemical which we import that works miracles with our thin soil. If we could get enough of it, we could remake our planet into a paradise."

"What's the name of the chemical?" asked Jason.

The old man did not reply directly. "I guessed why you came," he said. His eyes were clouded and stern. "Your father could have come home any time, if he had not wished to bring that Kransi woman. After she died we thought—" He broke off and started down the mountainside. "Merhaven is poor," he called back over his shoulder. "But we will not accept charity from a Kransian."

He wasn't going to make much headway against that kind of an attitude, Jason decided. Besides, for any marksman in the valley he was perfectly silhouetted against the sky. He scrambled down after his grandfather.

JASON CONSIDERED sleeping in his ship. It would have been safe enough, but with the repair crew working on it around the clock, it would be a little too easy for accidents to happen.

And then there was his grandfather. He was trying hard, and if he didn't succeed in being warmly hospitable, it wasn't for want of good intentions. He settled for some equipment he brought from the ship.

The old man disappeared in the middle of the afternoon, leaving Jason to entertain himself. He didn't wander far; there was much to see, but the people around him were by no means friendly.

He started toward the green fields he had seen from the mountain. Men were working in the fields and he turned around and came back. Those fields would have to wait.

The old man returned at dusk and they ate the evening meal in nearly complete silence. He tried to engage the old man in conversation on neutral subjects, but his grandfather doled out his words one at a time, and when he couldn't find shorter syllables he started spacing his answers at longer intervals.

Jason gave up and let the old man lead him to his room. As soon as he was alone, he walked to the window and looked out. The crew had set up lights and was still working on the ship. He closed and locked the windows and the door. He lay down, fully awake, and tried to reach some conclusion about Merhaven. Nothing came of his thoughts. The purpose for which he came seemed far out of reach. Kransi might want peace, but peace didn't seem to interest Merhaven. He would have to let the idea die.

At length he got up and quietly attached flexible strips to the edges of the door and around the window. He focused a remote circuit on the strips and set it for alarm. A few adjustments, and he was ready for any attempted invasion. He lay down but wasn't inclined toward sleep. Noise filtered in from the activity outside and lights flickered across the window. He reached out in the darkness and found the sleep unit. He slipped it on, activated it, and relaxed while a pure, monotonous tone massaged his skull. In five minutes he fell asleep.

Sometime later a large hand grasped his shoul-

and shook him roughly. "Wake up, laddie." The hand removed the sleepo unit.

Jason opened his eyes. It was dark. He sat up immediately. He had rigged up a warning system and it had failed to work. "How did you get in here?" he demanded unsteadily.

"Your equipment is worse than ours," grunted his grandfather. "It wouldn't stop a clumsy child." He went to the windows and opened them. Outside it was dark and there was not a sound. "The repairs on your ship are finished."

The meaning of that was clear enough. "I'll leave in the morning," said Jason stiffly.

The old man moved closer. He anticipated Jason and caught his hand as it fumbled for the switch. "I've sent them all away," he said in a choked voice. "But some of them may be waiting in the hills. You will be safer if you do not show much light." And he provided a tiny light from his pocket.

In the dim light Jason looked at him. The old man's cheeks were splotched and sulphurous; his eyes were inflamed and watering; his hands trembled. Jason caught the feeling of urgency and fumbled for his equipment.

"Do not tarry. Leave it, and I will send you better equipment to replace it."

There was no time to argue. Jason left them and followed the old man out of the house.

Near the ship his grandfather stopped and pressed something into his hand. "A stranger—but also my grandson," he whispered hoarsely. "You won't understand why I'm giving this to you. Neither do I. But with all my mind, though not my heart, you're welcome."

Jason tried to resist, but for all his trembling the old man was stronger, far stronger. "Take it," he rumbled, anger flaring in his voice. "Take it before I use it. I am tempted." He thrust it back into Jason's hand and stumbled away. "Hurry," he called.

Jason had every intention of hurrying, although he didn't understand everything behind his feeling. He got inside and readied the ship for take-off. He jerked it off the ground and kept going. Out of the atmosphere, he worked his ship up to its highest speed. Regardless of what he did he was taking a chance. Merhavians were waiting to throw their heavy stuff at him; and some of them had repaired the ship. If the repairman had made errors, deliberately or otherwise, he was finished. But the ship held up.

Safely out of range, he inspected the ship as well as he could from the inside. The repairs were more than adequate, in spite of the fact they had been rushed along at top speed. Practically, his ship was stronger than the day it had been built. They had even made repairs of a minor nature on his electronic equipment. Everything functioned perfectly.

He sat down in bewilderment. His grandfather had said they were poor workmen, poor technicians. He had direct evidence to the contrary. For that matter, his grandfather had said they were poor businessmen as well. And while it didn't signify that the rest of them were as good, it was true that his father, once he had left Merhaven, had proved to be a genius as an entrepreneur. Was the old man wrong there, too? He shook his head. It would take more information than he had gathered on this trip to decide that.

He remembered the item the old man had pressed into his hand before take-off. He retraced his steps and found where he laid it. It made no sense until he looked at it for a long time. And the clearer it became, the less he liked it.

His grandfather had entered the room in darkness, avoiding the alarm. Such stealth wasn't necessary, men outside or not; only Jason could have heard the alarm. The only logical explanation was that he hadn't wanted to awaken Jason—when he entered. For some reason he had been diverted from his original intentions.

His grandfather had given him a heavy-handled, long-bladed knife. His own words convicted him: he had been tempted to use it—on Jason. The gift of a madman—the knife that hadn't been used on him. They were all mad on Merhaven!

THE CALL CAME WHILE the ship was landing. He checked to see who it was—Restap Intrade—and rejected it on the grounds that the automatic landing controls were not functioning properly and needed his attention. To make his reason plausible, he nudged the controls at the proper time, and the big ship rose up and slid into the approach pattern again. Twice around, and he gained half an hour in which to think. The call he finally accepted was not from any Intrade official with whom he had previously had contact. He frowned. Airsta, Undersecretary of Intrade, was probably high in the hierarchy of Restap officialdom, but Jason preferred to deal directly with the top.

"I'm sorry, but Secretary Mofle is away," said Airsta, and she named the planet he'd left for.

The name meant nothing to him; there were too many places in the universe for anyone to be familiar with all of them. The secretary would be gone for some time and no one knew when he would be back. This wasn't to his liking. His hastily-conceived plans were running into obstacles.

The Intrade official seemed to sense his disappointment. She was rather tall. She carried herself well and had the body to go with her posture. She was quite young for the position she had in Intrade, an attractive woman with calm assurance. "In the Secretary's absence, I'm in command," she said. "He left some instructions, and if you don't mind, I'd like to discuss them with you."

That was a surprise. He didn't know a woman on Restap could have such a responsible office, at least not in Intrade. He looked at her carefully. Either she had a lot of ability or she had used her attractiveness as a woman to obtain such advancement. Maybe a little of each.

"We find our trade is out of balance in the Earth sector," continued Airsta. "In the interest of economical shipping, we'd like to equalize our imports and exports in that area. Perhaps you can help us, to our mutual advantage."

He certainly could—because it was a neat solution—for him. Intrade spared him a lot of trouble with their offer; that was what he was going to propose. It was more than a small coincidence, but he wasn't going to fail to take advantage of it.

He opened a cautious, exploratory discussion on Earth trade. At the end of a half hour he had learned two things. First, Airsta was exceedingly able. Her knowledge of Earth, however elementary, was sound. It was the result of hurried indoctrination by Intrade experts. But essentially she was slippery. He could get close to information he wanted, and she would turn the question aside, answer it in a way that was devoid of meaning. Eventually he would be able to learn what he wanted to know, but it was going to be a slow process.

Secondly he learned that Airsta knew he had gone to Merhaven. How she knew, he didn't ask, but it added to his respect for her. Not only was she herself able—she had a first-rate organization behind her. He would have to be careful.

The first phase of the discussions were complete. He snapped off the screen and left the ship. On his way to the hotel he noticed little islands of greenery in the midst of the bustling city. As green as anything he had seen on Merhaven. He was annoyed that he still thought of Merhaven.

LATER IN THE DAY Carlos came bouncing into the hotel. Her feet were on the floor as she entered and apparently touched nowhere else until she nestled in his arms. Her greeting, he decided, was not altogether cousinly. Her head was covered with copper ringlets and her fur was a wild mixture of patterns and glistening colors. Pleasing, but not sedate. He sat her down.

"Are you ready?" she asked.

"Ready for what?"

"The picnic," she said, rising.

In self-defense he sat down in the nearest chair. It was not an adequate defense. She curled up in his lap. "They've been so kind," she said.

"Who are 'they'?"

"Restapans, of course. Mostly, Intrade. They've made all the arrangements, co-operated with us in every way."

That explained something—why Airsta had been so wary. Intrade had half guessed the direction in which his current interest lay, and all their "co-operation" was merely a softening-up process. The Kransians were making it difficult for him. He began to regret the idea of a picnic, but there was nothing he could do about it, at this stage.

He tried to question Carlos about Kransi but she was too excited, and in the end he gave up the attempt. He had had little time to himself and he needed to reorganize his thinking.

His headache was real, and when he managed to convince Carlos that it was, it had reached proportions that only sleep could assuage.

Sometime later he awakened. His headache was gone, and Grandy was there. The old man was leaning against a curved board that fitted the contours of his body and tilted backward to compensate for his weight. He wore a toga-like garment; it was crumpled and did not fit well.

"Where's Carlos?" asked Jason, getting up.

"Out," said Grandy vaguely.

A thin slip of paper fluttered to the floor in the breeze that came from the air vent. Jason picked it up, noticing that Grandy politely turned away. Though he had difficulty with the Kransian script, Jason finally determined that it was meant for him.

"What's this?" he asked.

Grandy coughed. "You wanted me to charter a ship. This may be the bill."

Jason looked at him sharply; there was no question about it, it was the bill. Only the infernal Kran-

sian ethics about money matters prevented him from saying so outright. He studied it at length, puzzling out each item separately. A ship was a miniature world; it might give him a clue as to how they managed their planetary economy. But the longer he studied it, the less he knew.

"Is this all?" he asked when further examination seemed pointless.

"It's a fair price," said Grandy stubbornly. "The ship owner did not overcharge you much."

"Overcharge?" said Jason. "I don't see how he could get it off the ground for this." He took up the bill. "Food, for one hundred people, round trip." And he read off an amount. "This is impossibly low."

Grandy looked at him complacently. "There's lots of food on Kransi," he said.

Unconvinced, Jason nodded. It couldn't be that cheap. The last item showed how little hope there was for Kransi. They existed in a universe of sharp traders and apparently had never learned how to compete. "The charge for fuel is—exactly nothing," he said. Their naïveté was disheartening.

Grandy raised nonexistent eyebrows. "What did you expect?"

"It must cost something," said Jason in exasperation. "Iron, lead, or one of the transmuted artificial elements. Whatever it is, you don't get it for nothing and you've got to charge correspondingly."

Grandy shrugged. "Why should we charge? It's the easiest way to get rid of it."

"Get rid of what?" asked Jason. "Suppose you tell me just what it is that you have to get rid of."

Grandy moved closer and looked around. He lowered his voice. "This is what it amounts to," he whispered. "We cheat the Restapans."

That was debatable, considering the enormous difference in aptitudes. Jason said nothing and waited for Grandy to continue.

"We get the raw material from Restap and bring it back to Kransi for processing," said Grandy.

"Just a minute. Why do you get the material from Restap?"

"Because we don't have any," said Grandy. He scratched his head. "We've never let them learn what the processing consists of, otherwise they'd do it themselves and we'd be out of luck."

"At the end of the process we have goop. Most of it we ship back to Restap, but part of it we keep for ourselves. You've seen how we dress?"

Jason had, but Restapans certainly didn't dress the same way. "What do they use it for?" he asked.

"I'm sure I don't know," said Grandy with dignity. "I'm a culture custodian. I never pry into technical matters."

Meaning, of course, he lacked the training to understand. "What about Carlos?" asked Jason. "Would he know what they use it for?"

"Perhaps," said Grandy. "She's a composer."

It didn't sound promising, but he had to ask. "What does she compose?"

"Most anything," said Grandy. "She's best at animals, though."

Inwardly Jason groaned. His mother's family certainly had stayed clear of anything practical. A composer? Yes, of animals.

"Never mind what they use it for," he said wearily. "Tell me about the fuel."

"At the end of the process we have a remainder that can't be made into anything else. We used to have trouble getting rid of it. And then someone tried using it as fuel. And it worked." Grandy winked. "Naturally we didn't tell them about it."



"Naturally," said Jason gravely. Whatever they did use the goop for, Restapans weren't doing badly or they wouldn't continue the exchange. They could be depended on, to look out for their own interests.

"And the raw material from Restap," said Jason. "Just what is it?"

Grandy looked at him with superior benevolence. "I'm a culture custodian. Does that mean anything to you?" He saw that it didn't, and shook his head helplessly. "I know all about the raw material of my profession—what people sing, write, paint, and act. But the raw material you're talking about, I can't help you with that."

Perhaps his ignorance wasn't too incomprehensible, decided Jason. There were many products he used every day and yet he had only the vaguest idea of where they came from or how they were made. After a few more questions he filed the information in his mind for further use. The picture of Kransi was being filled in, however slowly.

TREES APPEARED TO BE all around. On closer inspection he realized that they were certainly not trees, though they were as tall. The giant, Restapan plants, whatever their origin, were an indication of an advanced biological science. Jason extricated himself from the crowd. There were too many people, and he couldn't remember all the names. There was his mother's sister. She resembled Carlos, except that she was no longer agile and was slightly thicker around the waist. There were others—but they were all mixed up, cousins, uncles, aunts, and still others whose degree of kinship had no meaning outside of Kransi. He was not comfortable with them.

Airsta followed him out of the crowd. She had made many of the arrangements and was present in an honorary capacity. She was very attractive in her cool competence, dressed in a manner unconsciously reminiscent of Earth fashions. The only discordant note was the tiny com-unit on her shoulder.

For most officialdom above the status of a clerk and all Restapan businessmen, the shoulder com-unit provided contact with the office. There were other means of communication of course, but the personal com-unit was first of all an indication of status, and no one authorized to wear it ever neglected to do so on the commercial planet of Restap.

Airsta's unit resembled a flower. But the mechanism within, though tiny, was complicated and didn't offer much scope for the artisan who created it. The flower looked more like an abstract design than an actual flower, and therefore stood out all the more—perhaps the effect she had intended.

She stood beside him on a rise in the small amphitheater, looking out over the antics of the Kransians assembled in the park. An athletic contest of some sort was in progress. It involved two contestants, each one grasping an end of a cord about five meters long. A heavily-weighted ball with a short stem slid back and forth along the cord on a swivel. A whiplike motion of the wrist sent the ball hurtling along the rope toward one end where the other contestant, with the same kind of motion, looped it back, faster. It was a duel, thrust and deflection and thrust again, and it required strong arms and a supple body to avoid a stinging blow on the head.

"Charming," she said, and he wondered how sincere her comment was.

"I don't think we'll ever understand them," she continued. "We've known them for a long time, and they seem no friendlier."

He nodded; they were childlike. By comparison, and he couldn't help making it, she was a mature person. After the jangling, wholesale introduction to them, it was a relief to be near her.

Airsta gasped. At first Jason didn't realize what it signified. He turned and followed her gaze. Down the slope came his grandfather, followed by ten Merhavians, all of them nearly as tall. They towered over the slender Kransians, groups of which they passed through, ignoring them. As nearly as he could see they were not armed; fortunately, neither were the Kransians.

"We've tried to keep them separated," whispered Airsta. "Until now we've been successful." She left his side and went to meet the Merhavians, who paused as she came up.

"We won't tolerate any disturbance," she said. "Please remember that you're on Restap." She moved her hand toward the shoulder com-unit. Now would be a good time to ask for help, thought Jason, but she didn't.

His grandfather inclined his head perfunctorily. "How could we forget it?" he answered, and went on to meet Jason.

"I'm an old man," he said in a low voice. "But not too old to realize that I've acted like a fool." He was calm and pleasant, not at all the same person he had seemed to be on his native planet. Only his dignity was the same.

From the corner of his eye Jason was aware that the games had stopped. The Kransians had drawn together and there was no longer any shouting. It was a tight spot. Originally he'd gone to Merhaven to arrange a meeting with the Kransi. He'd left without suggesting it because it hadn't seemed feasible. Now it had happened anyway, but he wasn't sure it was going to be friendly.

"The human mind isn't as logical as we'd like to think it is. And anyone can do strange things when he's emotionally upset." That was lame, but he hoped it expressed willingness to examine his grandfather's unexpected behavior on Merhaven. Willingness, but not necessarily approval.

The old man nodded, that was all. He was not accustomed to apologizing for anything, and it was too public here to discuss the subject.

"I've returned the equipment you forgot," he said, edges of a smile showing. "Also I've heard about Amity. I'm curious; perhaps you can tell me about it later."

Amity seemed a strange touchstone for them. Had he misjudged Merhavians too? It seemed so. He couldn't guess how his grandfather had heard about it, but, as long as he had, that was all that mattered. Ruefully, Jason decided he would have to learn something about it himself. It wasn't enough to be president of Amity. He'd have to have facts. He murmured that he'd be glad to discuss it.

His grandfather looked around. "I've never seen so many Kransians, nor at such close range." He seemed interested, and more than a little disappointed that Kransians were not monsters.

"They're all right," said Jason noncommittally. It wasn't wise to push an object lesson too hard. Let him find out for himself.

His grandfather glanced down. "I've heard your mother was such a trifle as that one." He sounded faintly amused.

Jason followed the direction of his gaze. In the interim Carlos had come up and stood at his side, not much higher than his elbow.

"You'll hear many things before your ears drop

off. Only a scoundrel pretends to believe them all," said Grandy from the other side.

His grandfather's eyes darkened. "I think you misunderstand," he said, his voice thicker. "To us, trifle means nothing derogatory. We have jewels that we call—" He broke off sadly, almost regretfully. He swung his arm in a huge arc.

If it had landed, something would have been crushed, the bones in his hand or Grandy's skull. With an ease that was deceptive, considering his age, Grandy moved aside. He clasped the great fist as it roared past his head and utilized the momentum of it to swing him behind. He clambered up the Merhavian's giant back and clamped a throttling hold on his throat.

With a bellow grandfather reached behind, tore Grandy loose, and threw him over his head. Grandy bounced, landed on his feet, and darted back.

Kransian men rushed up, and the women were not far behind. Outnumbered nearly ten to one, but far larger physically, the Merhavians drew together. Miraculously weapons sprouted in their hands. No gelsuns, or anything of that caliber, but the Merhavians were better prepared than a casual glimpse had revealed. Some carried long knives; others swung wrist-thick lengths of metal bars.

Jason shouted and ran between the two groups. Grandfather shoved him contemptuously aside and moved into attack. Before he fell, Jason could see his eyes. They were murderous.

Carlos flattened her body over Jason. "Stay down," she screamed in his ear. "You'll get hurt."

Jason grunted. Lots of people were going to get hurt, for no good reason. It was several minutes before he could shake her loose and get to his feet.

By the time he did, it was too late to stop it. The amphitheater was a trap. If someone had tried, he couldn't have selected a neater arena. They had to fight, even those who didn't want to; there was no place to escape to. Over the sides of the steep bowl perhaps, but those who climbed up were an irresistible target from behind. As he watched, a Kransian girl fell with a knife in her side as she struggled up the slope.

Jason looked for Airsta. She had disappeared, possibly summoning aid, though why she hadn't used the com-unit on her shoulder, he didn't know. Maybe she called for aid when he wasn't watching. Trembling with greater rage than he had ever felt, he rushed into the melee. These were his people, and they all had professed interest in Amity. A fist struck him on the temple and he fell again. This time he did not rise.

WHEN HE REGAINED CONSCIOUSNESS there was an uneasy silence. Airsta bent over him. "You're all right," she said. "Lie still." He ignored her; he'd been lying still. He moved his arms and legs; nothing broken, although he was stiff and sore. He sat up. He was still in the amphitheater. So were three Merhavians and several Kransians. Those who were able, with the exception of Carlos, had left. She didn't seem injured, but she was stunned and lethargic.

He got to his feet, Airsta helping him. Still the Restapan police and hospital corps had not arrived. Airsta interpreted his look. "They'll be here soon."

He hobbled among the fallen. One, a Merhavian he didn't know, unconscious but breathing, though he soon wouldn't be. The Kransian girl with the knife in her side. The bleeding had stopped; she twisted her head and stared at him blankly.

His Merhavian grandfather opened his eyes as Jason came near. He attempted to smile, but his muscles were no longer under control and he grimaced. "I didn't want this to happen."

Perhaps he didn't but, he'd done an excellent job of starting it, he and Grandy. Nevertheless, Jason believed him. He hadn't come with the intention of fighting.

"At the spacport they told me where I could find you," he whispered. "I wanted to see you—and them."

Airsta compressed her lips. She didn't say anything, but Jason could imagine. Someone at the spacport would get a strong note from Restap Intrade.

Grandfather was whispering again. Jason had to kneel at his side. "For a while I liked them. I'm glad." He coughed and closed his eyes and rested. With considerable effort he opened his eyes. "It was surprising to see what they were like. So peaceful." He licked his dry lips. "I don't hate anyone, even them." This time his eyes stayed closed and the granite in his cheeks seemed to crumble.

Jason stood up. The police and medical copters were settling in the amphitheater. The businesslike administration of which Restapans were so proud for once had failed to function. They were far too late. The hospital corps moved rapidly through the dead and wounded and the police cleaned up after them. They came to Carlos, and before Jason could protest, an orderly inserted a hypo in her thigh. It was probably just as well; she needed a sedative.

JASON SAT AT the Electronic Advisor; last time the answers had been less than satisfactory. It wasn't likely to be better now, but he did have more data, and maybe the machine could come up with something.

He actuated the Advisor and verbally gave it all the intermin information he'd collected. The machine took a long time to arrange it logically.

"Well, Jason, what do you think of it?"

"I don't know what to think," he said wearily. "That's why I brought you in on it."

"Of course. But there's such a thing as fringe information; you can't give it to me because you aren't aware of its existence. Nevertheless, it often influences your decisions. For instance, you may not categorize the expression on a man's face, but you will or won't trust him because of it. And you're usually right."

Jason brushed it aside. "It shouldn't have happened," he said. "There was no provocation."

"There *was* provocation. It occurred above or below the level of your perceptions, but it was there."

He had the frightening feeling the machine was right. "What do you mean?" he asked. This might be the first clue.

"Nothing in particular. A word, a tone of voice, a memory. A sudden movement that may have been only light flashing on a leaf and someone thought it was a drawn knife. Can you say it was none of these? It happened; and therefore there was a reason for it."

He couldn't say there wasn't, but everybody had memories and saw a leaf. If peace between them depended on so little, then it would never be achieved. The machine was missing something. And so was he.

"I have the illogical feeling it happened because of me," he said.

"Not illogical, supralogical," said the machine.

It seemed to be running more smoothly with the passage of time. "The picnic was arranged by Kransians, and your grandfather came to it, in both cases because of you. But in the sense of guilt, no. You couldn't foresee the result."

Jason didn't admit to need for the full psychiatric treatment nor the smallest part of it, and so he passed off the reassurance. "I'm the common link," he said. "Examine everything you know about me."

"There's another link you've forgotten," said the Advisor. "Restap."

"In what way?"

"No particular data. However, Restap has contacted Merhaven and Kransi for centuries. Obviously they've devised suitable techniques for that purpose."

"Separately they have techniques, perhaps. But that doesn't say that the techniques will work when the two come face to face."

"True. And I was implying no conscious manipulation on the part of Restapans. Nevertheless they can add to your data if they will."

The Electronic Advisor fell silent and remained silent. Jason waited while minutes passed. Still the machine did not reply. "What's the delay?" he said impatiently.

"There's more data," said the Advisor. "I'm examining it."

"Does it take so long?"

"In this case it does. The records of your father's conversation are suddenly available. Not less than one night a week, several hours each time. The entire period covers nearly fifteen years."

A mountain of conversation, and it took that long even for a psycho-computer to go through it. "Do you know why it's available now when it wasn't before?"

The machine went back into the past. "When the ship was on Merhaven, the repair technicians checked all circuits as a matter of course. They adjusted those that weren't functioning properly, including those in the memory bank."

That had a lot of implications, some of which he didn't like. "Did they get any information?"

"None. They weren't interested in anything you did."

That was better. And it was also proof, if he needed it, that Merhavians were more expert technicians than they pretended to be. "Just what light does this throw in the problem?"

"There are two facts," said the Advisor. "I'll summarize each, since references are scattered through several thousand hours of conversation—unless you'd rather have the pertinent quotations."

"The summary will be enough."

"Good. Your father was born on Merhaven and never left it until he came to Restap on business. It was here he met your mother."

That was news, how his parents had met. Although if he had stopped to think, he probably would have arrived at the correct conclusion. But the facts were better than logic. "I don't see what it adds up to," he said.

"Just this—a man from Merhaven met a woman from Kransi—on Restap. That's happened before, in space and on other planets, and in every recorded instance when they parted, regardless of sex or any other factor, one was dead. But in this case there was no conflict."

Jason closed his eyes; it proved something and yet it didn't. You'd expect normal persons to meet peacefully. The fact that there was only one such



meeting—did that prove that the people of Kransi and Merhaven were not normal? He rather suspected that it did, though he couldn't define what he meant by normal. Another thing—it had happened on Restap. What did that have to do with it? Planetary influences? If there was only the evidence of his father and mother to consider, he might accept that as a basis. But there was the picnic. Representatives of the two races met. Friction was at a minimum, and then, in the middle of a sentence something had changed—fighting broke out. And later, after the battle was over, the situation changed back again. Peace—conflict—peace. He couldn't put his finger on it. Fringe information, the Advisor had said, but he knew his Merhavian grandfather had gone through those stages. There was no planetary influence that could account for it. Not in such a short time.

That left another factor. He opened his eyes. "Hypnosis?" he asked.

"By Restapans, you mean," said the Advisor. "Use your head. The conflict between Merhaven and Kransi existed before Restap was settled. It had prior origin. Besides, mass hypnosis is more difficult than that. On a planetary scale it's impossible. In addition, there are simple tests to detect it, and everyone knows what those tests are, including Merhavians and Kransians."

The machine was right of course. History proved that Restap couldn't have caused the basic conflict. Still, he had to start with something. "Telepathy?" he suggested.

"What does that hypothesis add? The human race may be evolving in that direction, but so far not one individual is capable of it."

It was true; hypothesis didn't explain much. If either Kransian or Merhavian were telepathic, the friction should decrease between the two—unless telepathy had other laws, and no one could be sure it didn't. But what if Restapans were telepathic? It might make them wonderful businessmen, and of course that was plausible because they were. The whole planet bristled with new buildings and everyone looked contented and well fed. But prosperity was no crime; plenty of planets were prosperous without telepathy. Earth, for one.

So telepathy and hypnosis were out. But he had to find the forces involved. Restap was the best starting point, and it was up to him to figure out how to start.

He got up and went to the machine.

"Don't you want to hear the other fact?" asked the Electronic Advisor.

He had forgotten about it. The machine had said there were two pertinent facts in the records of his father's conversation. The other fact might help. "What is it?" he asked.

The Advisor was hesitant. "I want to emphasize this was merely his opinion. I have no way of checking whether it was actually true. Nevertheless there are at least fifty references to it."

"Let's hear it," said Jason.

"Your father was convinced he killed your mother."

"Nonsense," said Jason harshly, remembering his father and the multitude of doctors. "She was never

well after I was born, but he was wealthy, and she got the best medical care in the galaxy."

And so she had. The great specialists of dozens of planets attended her—and hadn't found a thing wrong. But she had died—very young.

Jason remembered a time; he was only a child. His father had come home, one of his rare appearances on Earth. Jason was certain they loved each other, but they were seldom together.

Jason turned off the machine.

HE REVIEWED the problem for an entire day and at the end of that time reached certain conclusions. Any solution was far off, but he thought he knew a route through which to arrive at one.

Restap. How much Restapans knew was problematical, but they had to notice that they were unique with respect to their contacts with both Kransi and Merhaven. How much theorizing they did about it was unknown. Perhaps they attributed their success merely to superior ability and let it go at that.

He could call in the experts, but where would they start? There was enough material for all: semanticist, psychiatrist, legal expert, culturologist, and a detective or so. Give them enough funds and they would come up with an answer in a year or so—if it didn't take twenty.

He took standard precautions, and a few that were not standard, too. He checked the set—the hypno-cartridge was in place and showed a few thousand hours left. As a safety measure, he replaced it with a fresh unit. All antihypnotic devices were supposed to be tamperproof, but he trusted only those he had brought with him. He let the set warm up until the light blinked on the fresh cartridge. Once he knew he was safe, he dialed Airsta.

"I'm going to call off the negotiations for today," he said watching her face. Apparently he didn't overdo it.

"I'm sorry," she said. "I think I understand." "Burial custom of any kind I'm not fond of. Besides, I don't think I should go near Merhaven."

The screen flickered and her face wavered. He frowned; he didn't welcome interruptions.

She noticed his expression. "There's an illegal transmitter in the area," she said. "We're tracking it down, and it will be off the air soon. We can continue this discussion later if you'd rather."

He shrugged. "It happens on the best regulated planet." His manner, he hoped, was appropriately grave. "In fact, I want to call off negotiations altogether. Right now I'm at a disadvantage. In a few months I'll be better able to take care of my end."

It worked. She was careful not to let her disappointment show. "Why not go to a rest planet?" she suggested. "One of ours is nearby, in a neighboring system. It's reserved for our high officials, but I can get you in."

He pretended to think about it. "If it isn't too much trouble—"

"Not at all," she said. "Someone from Intrade will have to go with you, but that's no problem. I can get away."

That was more than he had anticipated. Someone would have to go with him. He expected that, but he hadn't planned that it would be Airsta. He wished it weren't.

Not that it made any real difference, anyone from Intrade would do. And the higher that person was, the more information he would be able to get. But it made the situation awkward.

Again she read his expression. "You're not an antifeminist, are you?" she said, sounding faintly amused. "I thought that on Earth women were accepted as equal in every sphere of behavior."

Before he could answer, the screen whitened in a manner frighteningly reminiscent of the attack on his ship near Merhaven. When he opened his eyes Airsta wasn't on the screen, but Carlos was.

Her face was streaked and her hair tousled. "They won't let me up to see you. I've tried, but they turn me back."

"Who won't let you?" He had no privacy from the Kransians. They ran in and out of his life like children, and he didn't approve.

"Restapan police," she said dazedly. "There's a guard around the hotel and I can't get through."

"I'm very busy," he said. "Do you have anything in particular that you want to talk about?"

"It's about the picnic," she said.

"A very unfortunate affair," he said. "I'd like to forget it as soon as I can." He looked at her with some concern. "Of course if you feel it will do you any good, go ahead and talk about it."

"I can't, not over this," she said, and covered her face with her hands.

She was plainly upset, shock no doubt. But he didn't have time to soothe her back to sanity. In time she'd recover by herself.

"I'm leaving soon," he said. "But I'll be back and I'll see you then."

She stared at him blankly as the screen faded.

Her face was replaced by another, equally familiar. "That's the illegal transmitter," said Airsta calmly. "The police have found it, and she won't bother you—unless you want her to."

"I don't."

"I thought so. That's why I put the guard around the hotel in the first place. Just say the word and I'll have it taken away."

He didn't say it. Carlos wouldn't be happy, but for the time he would have to work alone. And the results he expected were more important than Carlos' injured feelings.

"Don't worry about her," said Airsta. "We never press such minor charges against Kransians. That's the penalty we pay to keep on good terms with them."

Understandable. That was good business policy. But he wondered whether he was backing the wrong people. In a way he was more like Restapans than those who figured in his ancestry. Restapans were sensible and mature.

He concluded the arrangements with Airsta and, after she had hung up, he relaxed to think. It would take three or four days to get to the rest planet. He would have to use drugs while she was sleeping. Fast-acting drugs that would take two or three hours out of her life that she wouldn't remember. During that time he could get information about Kransi and Merhaven. By the time they reached the rest planet all trace of the drugs would be gone. It would require an exceptional examination to reveal what had happened, and then only if they had machines of the quality made on Earth. There weren't many, and Restap probably didn't have them.

He was sorry it had to be Airsta, but there was nothing he could do about it. He liked her, so he comforted himself that the information she undoubtedly had meant nothing to her—or Restap—though through habit they wouldn't want to share it.

A scientist could make something out of it, could begin to unravel the problems of Kransi and Mer-

haven, and it was up to him to see that scientists had that opportunity.

Before he fell asleep, he thought about Carlos. He wished he had time to see her.

THE SHIP SLID ALONG in the grayness of between-space. Jason frowned; a battered hulk was overtaking him from behind. And it shouldn't; he had a good ship, not as fast as the best military, but the equal of any commercial ship built.

He opened the last notch of power and that made a little difference but the difference didn't favor him enough. The ship came up even faster. Then, as if sensing Jason's ship had reached its limit, the decrepit Kransian vessel closed the gap with startling speed.

Grandy's face appeared on the screen. "Congratulations," he said.

The frown got a few lines deeper. Was that Grandy's idea of a joke on Jason? He couldn't escape them anywhere—hotel, or space between the stars. Jason ignored the remark. "What have you got in that ship?"

"Nothing," said Grandy proudly.

He wasn't in the mood for games, and hoped it showed on his face.

Grandy winked. "Nothing at all," he said firmly.

Then it was only the fuel they thought they got for nothing from Restap, the by-product of manufacturing goop. As far as he was concerned a fuel like that wasn't a secondary item, it was the main thing. And there would be a lot of others who would agree with him. That it could add such speed to a ship ready to fall apart was incredible. Later, when he was free of present entanglements, he'd help them market it, outside the Restapan sphere of influence. It wouldn't be hard.

"I'll discuss it later," said Jason, sensing that someone had come in behind him. Airsta was there.

Grandy nodded in relief; his secret was safe. "You ran away before we could get in touch with you. Then we heard about it and decided to give you a present."

"Hear about what?" asked Jason. Grandy had a genius for befuddlement. He could tie up a semantacist for hours with a simple statement.

"Do you want it or don't you?" asked Grandy. "If you do, get your grapples ready because we're going to shoot it over."

"Take it," urged Airsta in a whisper. "You can get rid of it later."

Jason stared at her. That was the wrong reaction. She should have been interested in the speed of the Kransian ship, and instead was intent solely on getting them out of the way.

"What is it?" Jason asked Grandy.

"You'll see. And be careful. It's rare and delicate."

"Get it over with," advised Airsta, her back to the screen. Grandy couldn't hear her.

Jason went to the controls and opened the freight lock. He maneuvered the ship as close as he could to the other. In the next few minutes he had all he could do to get the transfer can inside. Once it was there, he closed the lock.

Before he could get in touch with Grandy again, the Kransian ship had turned around and was speeding away. Jason put the ship on automatics.

"Leave it there," suggested Airsta. "It will keep."

He shrugged. "Grandy says it's delicate." He went down to the freight bay, Airsta following.



It was an ordinary space transfer can, and it could be heated inside, if the cargo made it necessary. It was heated.

He opened it. Inside was a cage, and in the cage was an animal. On the cage was a tag. Written in the queer flowing Kransian script was one word. He deciphered it. "Congratulations."

That was what Grandy had first said, and here was more of the same. He didn't like it any better this time. "What does this mean?" he asked her.

"I think there's been a mistake," she blushed.

She was a woman, of course, and what occurred in the capillaries of her cheeks was nothing unusual. Not unusual, but it made him uneasy. "What kind of a mistake?" He thought he knew.

"According to our custom," she said, "when a woman leaves Restap alone with a man—"

"I can guess," he said. "She's considered married to him."

"Not quite, although it is an announcement of intention. However, my position in Intrade overrides the fact that I'm a woman, and since it's not your custom, I didn't consider either of us bound by it."

"You're right," he said. "It's not my custom, and this is a business trip, not a prenuptial flight." That sounded harsh but he let it stand. It was a good idea to make his position clear from the beginning. Actually she was an attractive woman, very much so, and certainly a capable one. Under different circumstances—with a shock he realized that under different circumstances he might not object. That was not what he had intended at all.

She half turned away and he couldn't accurately determine her reactions, but he felt it was no surprise to her.

"Get rid of that thing," she said, indicating the animal. "Shove it out. I don't want to see it."

Of course she didn't. It had served to focus his attention on something she had wished concealed, for whatever reason. He could examine what those reasons were later. In the meantime he could add to her qualifications: she was also a ruthless woman, if crossed.

"Hardly," he said. "It's a living creature, highly evolved. Do you know what it is?"

"We have some in our zoos," she answered. Her voice was not steady. "Now, will you get rid of it?"

He ignored the suggestion. Airsta crumpled the congratulation card and stalked out of the freight bay toward the upper part of the ship.

There were a number of items he had to straighten out. He sat down beside the cage and read the plaque.

ROSILING: a rare species of animal native to Kransi. Valued as an intelligent, docile pet.

It had more fur than he had ever seen on an animal, long curly golden fleece. The fur was matted thickly over the entire body, but was even more bushy on the creature's face. How it could see at all through the fur was a mystery. The forelegs were shorter than the hind legs and it moved with kangaroo-like hops. It whined coaxingly at him.

Intelligent, docile pet, the plaque said, and so he opened the cage. It hopped out and rubbed against him. About as high as a large dog, there was no other point of resemblance.

He stroked the rosling's head and then uncomfortably withdrew his hand. It was sticky. The creature's eyes were watering. Perhaps it was sick. He'd have to turn it over to a zoo, where it would receive proper attention.

The rosling was unimportant in itself, only it reminded him of the main problem. Airsta had been on the ship two days and he had made no move to secure the information he was after. Why hadn't he? There wasn't much time left if he was ever going to succeed.

He thought he had been clever in isolating an Intrade official, but now he wondered. Which one of them was isolated? It was his ship, and he could find out. He walked up the passageway, the rosling hopping ahead of him. It disappeared into a side corridor and he let it go. It could do no harm.

HE LOCKED HIMSELF in the lab and turned off the screen. Anyone of importance who ventured outside the boundaries of his own influence took chances. A good lab, though it didn't provide complete protection, reduced chances to a minimum.

Jason thrust his hand into the aperture of a small machine and held it there until he felt the needle slide into the flesh and then withdraw. In a few minutes the report was ready: no trace of any drugs; endocrine balance normal. The report on drugs was satisfactory, but the endocrine balance was not. His body chemistry fitted into no exact category, and his glandular reactions were always above or below, but never in the normal range. He was a hybrid, product of two different races; it was not strange that he shouldn't be normal; it was unexpected that suddenly he should fit in with the rest of mankind. He shrugged, he'd check again in an hour or so; if he was still normal then, he would worry. However, for a long-term control of a subject, drugs were crude,

and he didn't expect to find anything on that score.

There were other tests, and he took them all, with the clear precision of a man who had gone through it many times. The final summary was disappointing, and disturbing. No trace of hypnotism, not an element of suggestion anywhere in his mind. Nevertheless his responses were flattened out, muted in an astonishing manner. Encephalocurves that usually peaked and dipped to the edges of the graph now wavered comfortably down the middle. He had seen his analysis too many times; it wasn't he. Anger and elation were gone, despair and urgency were missing from the picture of his mind. Responses like this could be obtained by drug or refined methods of hypnotism and in no other way. Yet he could eliminate both; his instruments were too good—he'd swear by them.

There was, there had to be, another way to control an individual. Because someone had suppressed his reactions. If he needed proof other than that his instruments gave him, it was right in front of him—he hadn't got the information from Airsta. Hadn't got the information, and, until jolted out of his lethargy, hadn't thought about it. He didn't have much time to wonder about it. A loud scream came from the rear of the ship. He leaped up and closed the lab. Before he could get to her room, Airsta met him in the corridor.

"It attacked me," she said, her voice quavering with anger. "You'll have to kill it."

She was disheveled and seminude. Evidently it had occurred while she was undressing. There was no visible wound, and considering the amount of her body exposed, eliminating anything serious. "The rosling?" he asked. "I'll put it back in the cage."

"You'll kill it," she insisted, near hysteria. "It crept into my cabin and leaped on me while I was changing."

Before he could answer, the rosling came out and hopped warily toward them. Screeching, Airsta fled. He knew where she was going and got there first. He grabbed the weapon from the desk and held it out of her reach. The rosling was essentially a docile creature and he wasn't going to see it wantonly destroyed.

The rosling appeared behind them. Again Airsta fled, found a cabin that was open, turned into it, and slammed the door behind her. Jason gripped the weapon nervously, and then thrust it into his jacket. The rosling wasn't acting docile, now, but it was a little creature and he could cuff it senseless if he had to.

The rosling stood erect, to his surprise. It came closer and leaped into his arms. "Jason," wept the rosling.

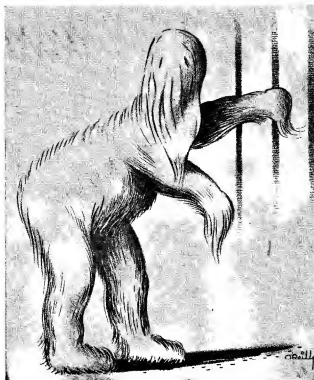
He could recognize the voice anywhere. "Carlos!" She thrust her damp muzzle into his face and meant it for a kiss. Then she wriggled out of his arms and locked the door of the cabin Airsta was in. Limping, she came back. "Jason," she whimpered.

He led her toward the back of the ship and sat her down. He wasn't anxious to have Airsta overhear what she had to say. At the moment, until he straightened things out, he didn't want Airsta near him.

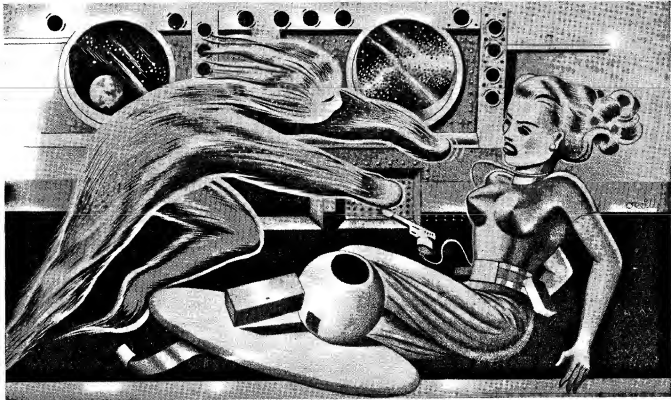
"Suppose you tell me why you did this," he said as soon as Carlos stopped shaking.

"This is one of my best compositions," she said proudly. "I can fool even an expert with it."

Composition? Grandy had said she composed animals. He hadn't got to the end of it, but maybe her talent wasn't as impractical as he had once thought. "How did you do it?"



"ROSLING . . . an intelligent, docile pet."



"It crept into my cabin and leaped on me..."

"Goop, to grow hair. You know about that. But there's a derivative of it that makes bones supple. We use that in childbirth. Between the two chemicals I can twist my body into practically any shape and hold it as long as I wish."

It was logical to assume that a substance as complex as goop would have many derivatives, each of them with special properties. "But why did you do it?" he asked.

"Because I had to," breathed Carlos. "She was going to marry you."

"I think I've disposed of that," he said dryly.

"But you haven't," said Carlos. "You are married to her, as much as any non-Restapan can be."

Airsta had misled him. An "announcement of intention," she had said. It was stronger than that. For practical purposes he was her male concubine. And it was legally embarrassing. He hadn't known about that aspect of Restapan law; but he did know others. One feature was that the non-Restapan partner in semi-marriage had no legal rights. On Restap or any of its possessions his wealth belonged to her.

Fortunately, though, there was an interstellar law. It consisted mostly of loopholes. He could fight her claims successfully anywhere except on Restap. He could never go back there.

He had started out nicely with his own trap—and walked into one of her contriving. If it were she who set it up. What was the purpose behind it? It had to be connected with his interest in Kransi and Merhaven.

He inclined his head. "Tell me the rest of it!"

"Please," said Carlos, squirming uncomfortably under the matted fur. "Let me get this off."

"I have a laboratory," he said ruefully. "But you won't find the chemicals you need."

"To grow it, I wouldn't. But I can mix up something that will remove it."

She left, and in a quarter of an hour was back, the Carlos he could recognize again. Her hair was close cropped and it was still gold—she hadn't been

able to change the color. She had sheared the fur remaining on her body so that it was a reasonable duplication of her everyday attire. The bones in her thighs were nearly straight as her muscular control counteracted the effects of the chemical that had made them supple.

There was time for personal appraisal later. He sat down beside her. "Tell me everything you know."

She looked at him doubtfully. "Something changed in you during the picnic," said Carlos. "I don't know what it was, but I could feel it. I think Airsta had something to do with it." She took a deep breath. "Afterward, when we couldn't get in touch with you to tell you about it, we learned where you were going, and I persuaded Grandy to get me on board. I would have escaped from the cage anyway, but it made things easier that you let me out. I wandered into Airsta's cabin, but she chased me out."

"I came in again while she wasn't looking. I hid until I couldn't stand it any longer. Then I leaped out and bit her."

He frowned; he had expected more information. Airsta was part of a big plot, and Carlos had prevented his stumbling into it too far to get out. But if he were going to unravel it to the end, he must know more. "Why did you attack her?" he asked.

Carlos grimaced. "Because there in her cabin, watching her undress, I disliked her. I couldn't like any woman who was scheming to get you." She had difficulty breathing.

Fringe information of course, but it added to the picture. Under the circumstances, no woman would like Airsta.

"I think it's time you let me out," said Airsta.

He looked up. She was at the other end of the ship, but the screen was on. It didn't matter that she had been listening; she was safe enough where she was. "Any time. Just tell me what I want to know."

She laughed, completely comfortable in the situation. It was not attitude he expected. "I'll wait till the rosling dies," she said.

He turned; Carlos was sitting where she had been, but it seemed an effort for her to remain upright. Her face was rigid and yellow and her breathing was convulsive.

Suddenly he felt close to the answer. All the bits and pieces of fringe information were drawing together. And when they coalesced, the solution would be near. "You'd be glad if she did," he said carefully. "But I'll hold you responsible."

"But I've done nothing, Jason. If she dies, it will be because of you. Don't you know that?" She was working hard at it—that was obvious—but it didn't pay to discount what she said.

Carlos was reacting to something; it might be him. If allowed to continue, that reaction could be lethal. It wouldn't take long at this rate. The change in her appearance was startling. He couldn't be the cause. He'd been with Carlos for days at a time, and nothing like this had occurred. Mentally he corrected himself. He'd been with her—Restap. That planet again.

He tried to make her comfortable, straightened her cramped legs, and laid her down gently. Acting on a theory, he brushed his hand over her face. She tried to smile but without success. He was right; at least it was partly a question of proximity.

He stood up. "What can I do for her?" he asked Airsta.

"Nothing. You're the cause, but you can't help her. I can, and when I get out of here, I'll see what I can do."

If that were true, and it was an assumption he wasn't prepared to make, she could do it as easily from where she was. "I'll see," he said, and left Carlos there.

A half hour before, until Carlos had driven Airsta from her cabin, he had been sluggish. He wasn't now. If he had time, he could take the same tests, and the difference would show. But he didn't need to take them—he knew he felt different. He was his old self again—a person who could be dangerous, for Airsta.

Carlos had surprised Airsta in her cabin. It seemed to hinge on that. If he could question Carlos more closely about it—but she was past speech. Meanwhile, there was her cabin. He could examine that.

Airsta was on the screen when he entered. She watched him impersonally while he ransacked her belongings. Piece by piece he took the cabin apart. When he found nothing he went through every item she had brought with her.

"You won't find anything," she said. "The effects on Carlos are purely mental."

She was good at it; he nearly believed her. "Hypnosis?" he asked, trying to keep the strain out of his voice.

She laughed easily. "That's what you were going to use on me, or something like it. However, it's not hypnosis; you know it isn't. You've checked yourself thoroughly."

She leaned toward the screen. "The truth is that Kransians are emotionally unstable. When they come in contact with other races they react—unless a Restapan is very near and consciously gives them emotional support."

Now she was talking like a mystic. "Emotional support"—well, Restapans did something, but it wasn't comparable to a child leaning on his mother.

Silently he went back to Carlos. She was worse than she had been, but not as bad as he expected. There was at least an element of truth in Airsta's

claim. His effect on Carlos was accumulative. By putting distance between them he had retarded the progress. If the ship were big enough, by placing her at one end and remaining at the other, she might recover. But the ship wasn't that big.

Airsta looked out of the screen at Carlos. "There's still time," she said critically. "But not much."

He glanced again at Carlos. There wasn't much time. He went through the ship to the cabin in which Airsta was presently confined.

She came out, her clothing skillfully disarranged. "You'll have to let me get dressed," she said, attempting to cover the uncovered parts and revealing more in the process.

He nodded and accompanied her. Whatever it was she relied on, it was in her cabin, and he had failed to find it. Her talk about the mental effects on Kransians was pure camouflage. There was something she had to get to, without letting him know what it was.

At the entrance she paused. "You have a perfect right to come in," she said huskily. He knew what he should do, but restrained himself; he managed a smile and it gave her ideas.

She talked while she changed to the skin. Her voice was low and consciously pleasant, and she kept the intellectual plane as high as the physical side was obvious. Philosophy and strip-tease. A discourse on the obligations of Restap toward less fortunate people, coupled with an exhibitionistic display, and her body was good enough—normally it would have been distracting.

Time was running out. Carlos had been near her end when he last looked at her, but Airsta couldn't afford to let her die, not while he had the weapon.

He took it out of his jacket and adjusted it, making sure she saw the setting. The gelatin pellet would be calibrated as it left the muzzle, and when it struck it would spread, something like the effect of a giant fist. One would stun, and a dozen would break every bone in a man's body. There were other settings, but they were merciful and would kill outright.

Airsta didn't mind, apparently. She put on the last of her clothing and stood up. "Let's look at your darling," she said airily.

There was something false in the performance, and he couldn't place it. She hadn't expected results from her display, merely intended it as a distraction. It had failed because he had watched every move she made. She hadn't touched anything but her own clothing. And the outer garment was the same one she had been taking off when Carlos had surprised her. He could tell because the com-unit that looked like a flower was still fastened to the shoulder.

And yet, had she failed? His own irritabilities were not so high; he could tell because he was watching for it. She might have used the strip-tease to gain his visual attention while she concentrated on the mental level. He refused to think about it.

He walked behind her to the room in which Carlos lay. "She's better already," said Airsta.

He couldn't deny it. Her breathing was natural and her muscles were not cramped and twisted. She was still unconscious and her face was spotted and sulphurous, but she was coming out of it.

"I'll take the gun," said Airsta. "As long as you're near, she's not safe unless I'm also alive, and willing to help her out. But you might get other ideas." She brushed her shoulder.

The impact was almost physical. He wanted to

believe Airsta. It would be so peaceful if he could. But the gesture toward her shoulder ruined it.

She was out in space and from here the com-unit wouldn't reach any Restapan station. She had no business wearing it—for that purpose. She was using it for something else—against Carlos.

He extended the gelgun with his left hand and watched her come close to take it. He remembered another face like Carlos', as tormented, as deathly. It had been the face of his Merhavian grandfather as he, Jason, lay that night in a darkened room.

That, too, she had against her. Airsta reached out for the weapon—and he hit her with his fist. It took only once.

CARLOS OPENED HER EYES. She was in bed and the sun was shining through the window. It wasn't a ship, she knew that. "Where am I?" she asked delightedly. "It isn't Earth, if that's what you're thinking," said Jason.

"Tell me," she insisted, her eyes shining. "Merhaven."

She lay very still while her mind worked on that information. "Kiss me, quick," she said. "They'll kill us."

"Will they now?" he said. He went to the door and called out. A tall rawboned man came back with him. "This is my cousin—father's side. Tell us, Burons, what are your intentions?"

"Every young man has them," said Burons admiringly. "Is she married?"

"Spoken for," said Jason firmly. "But what else?"

"I foresee a vurra fine relationship with Kransi," he said. He looked at Jason, winked at Carlos, and left.

"What do you think of him?"

Her eyes were wide. "I like him," she said finally.

"Were you afraid?"

"I've never been afraid of anything."

That was very nearly true. "It's all settled," he said. "Go back to sleep."

"I've been asleep," she said indignantly. "You've got to tell me what happened."

He sighed; there was a lot to tell, but he did the best he could. In the middle of the narration she looked up and saw the com-unit on the wall. "That?" she said, indicating it with her eyes.

He nodded. "It doesn't look like much. Even when I opened it, it seemed like an ordinary com-unit. But a very close examination showed that there were really two transmitters inside, one very different from the other. And the output frequencies of the unconventional transmitter don't register on standard equipment, or even a special kind."

Jason went on with the explanation; when he finished, Carlos was drowsy, if not enlightened. Quietly he left the room. He didn't go far, he had to stay within range of the transmitter on the wall. But Merhavians were working on similar ones, and within a short time there would be larger units in operation.

It was simple, when you knew the forces involved. Mankind was evolving toward—what? Maybe it was telepathy, maybe something else. Whatever it was, no race or segment of a race had got there yet. But in a thousand years or so a child would be born—and someone would learn what unique capacities he had.

Meanwhile there were intermediate steps, and the people of Kransi and Merhaven were part of the way along. One of the consequences of that evolutionary process was the production in each mind

of the higher neuronc frequencies. At that level trouble started. Those frequencies were often irritating to other delicately and differently attuned minds. The more sensitive the individual might be, the easier it would be to throw the individual out of self-control. The mind couldn't adjust to static.

It could be compared to another kind of irritation—allergy. But this kind of allergy wasn't physical at all and couldn't be detected by physical means.

Jason had a clear picture of his mother and the specialists who attended her. Now he knew facts that he had not known. She had died because of the presence of his Merhavian father, and to a lesser extent, himself. His tortured and guilt-ridden father had killed his mother, but not in the way he thought.

The people of Kransi and Merhaven reacted to each other—violently—on the neuronc level. They had never suspected why, but they had always known that the other had to be killed as quickly as possible if they themselves were to remain alive. They accepted their fate and thus they fought whenever they met.

Long ago on Restap someone had been curious, had investigated and found out the cause. Working on this information, Restapans had built a transmitter that could blanket the irritating and lethal frequencies. They had kept the secret of the neuronc transmitter well hidden, and, using it cleverly, had advanced to wealth and economic power. They alone could successfully contact both Kransi and Merhaven, and they had kept these planets under firm, though concealed, control.

Jason had represented a threat. He was linked to Kransi and Merhaven, and if allowed to go on, sooner or later would have stumbled on their secret.

There had been an earlier threat—his mother and father. They had met on Restap, and as long as they were near a neuronc transmitter, they were free to fall in love, which they had. Restap had forced them to leave, and they would have died soon, but instinctively they had worked out a solution that had enabled them to survive. It was a simple solution—they met only for brief periods. It was for the same reason that Jason's father had seldom come to see him.

At any rate, his mother had lived long enough to give birth to him, and his father had lived longer and piled up great wealth, which he left to him, offering position and prestige.

But when he returned to Restap, Jason's wealth was an obstacle. A penniless person could disappear without a comment, but not someone of his economic status. Above all, Restap couldn't stand investigation.

However, they had no objection if he were killed on Merhaven, and so they had allowed him to go there, knowing that Merhavians would react to him as they did to a Kransian. He would have died on that planet, if it were not for his grandfather. All that saved him was the gigantic stubbornness of an old man, who, no matter how much he was goaded, would not dishonor his sense of kinship.

When he returned, alive, they were close to the danger line, and so they had shoved forward their hatchet woman, Airsta. That was why Secretary Mofle of Restap Intrade disappeared. Airsta had staged the picnic, even to bringing his grandfather. At the proper time, in synchronization with the one inside-the-shoulder com-unit, she had turned off all the neuronc transmitters in the city. Merhavians and Kransians did the rest—they couldn't help it.

But he had survived, and hadn't been convinced, as she had intended, that there was no solution to

the age-old conflict between Kransi and Merhaven.

And so they had to take the next step. Airsta had been instructed to entangle him, and she had come close. If Carlos hadn't intervened, at least she would have tied him up endlessly in lawsuit after lawsuit. He would have been so busy defending himself he would have had no time to turn his attention in a direction that might threaten them.

But they hadn't intended to stop with that. At the rest planet he would have been helpless. His mind was neither Kransian nor Merhavian—but a little of both. It was possible that a very strong neuronic field would have effects on him that they would consider desirable. At any rate, there was nothing to stop them from experimenting on him, and they had planned to do so.

It was not too pleasant a situation to be involved in. He gave an involuntary shudder. Then his thoughts turned to Carlos.

Jason wandered by the window and peered in. Carlos was sleeping. His mind produced both frequencies; his body had adapted to them when he was young and infinitely plastic. He could live with either frequency, but Carlos could not.

She had frightened Airsta while the latter was undressing, and the neuronic transmitter in the communit had accidentally been turned off. Then Airsta had the problem of turning it on again without his knowing it. She had been clever, but she had overestimated the effect it had on him. It wasn't as great as on the pure strains. It brought a feeling of peace to him, as it did to the others, but he had been able to stand back and analyze it for a fraction of a second. A fraction of a second was all he had needed.

He went back into Carlos' room and sat down.

"You cheated," she said, opening her eyes.

He laughed. "How?"

"Because you didn't tell me why you came to Merhaven instead of Kransi."

"I'll trade questions—one for each of us."

She stretched. "Mine first."

"Agreed." He looked at the transmitter on the wall, and it was a deadly thing. Or a life-giving one, depending on who used it. "When I examined it in detail I found that very few parts had been made on Restap. Mostly it had been bought on Merhaven and merely assembled on Restap."

"So I came here, knowing that I was safe as long as it was running. Merhavians had made it in the first place, though they hadn't known what they were doing. Once they knew, they could make it better. Your people are not that kind of technicians."

She turned away from the wall. "They buy things from us too. I wish we didn't have to sell to them."

"We'll change that," said Jason. "I know they buy goop, but what else?"

"That's it, mostly. The goop they buy is modified, though; it can't be used for clothing the way we use it. On Restap they call it a fertilizer. In the form they get, I suppose it is."

That was the substance his grandfather had spoken about. It could change Merhaven. The gaunt valleys, lovely though they were now, could produce

food as well. The picture was growing dark for Restap.

"I've used up my question," said Carlos. "But you have to tell me. What did you do with Airsta?"

"The Merhaven authorities wanted her. I turned her over to them. Two of their citizens died at the picnic." At worst she was only an instrument of higher forces, but no human being is ever that helpless; it was the bare minimum of justice.

But the plan he worked out for the ultimate disposal of the neuronic transmitter was more than just. Once the Merhavians had manufactured enough for their own and Kransian needs, he was going to turn it over to Amity.

They needed a strong president, and he could change his nominal office into a functioning one. There was such a thing as xenophobia, but it was much more rare than people thought. Mostly, it was reaction at a level that no one had looked into. Under his direction the conflicts that everyone had accepted as inevitable were to receive close scrutiny. And he had a powerful instrument to help him. There would still be conflicts, economic and otherwise, but those which had no real basis would cease to exist.

"What's your question?" asked Carlos.

He thought he knew the answer, but he had to ask. "What's the raw material for making goop?"

"That's silly," said Carlos. "Uranium, of course. We transmute it until no one can recognize it, a long organic compound you wouldn't guess came out of a single element." She looked at him meekly and sighed. "It's not very plentiful in Kransia and no one uses it any more. Our only source is Restap."

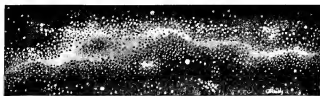
It was not surprising. The principal victims of Restap had been Merhaven and Kransi. Restap had had to hold them apart, but for the sake of their own needs, had been forced to develop them into an integrated economy. And neither had known.

There were parallels on earth to match the situation, but it still hurt to see that the brightest dreams of pioneers had come to this.

There was an interstellar law, but it was useless to prosecute Restap under it. And it wasn't at all necessary. They had set up their own trap, and now it had fallen shut on them—with a bang. Because Restap didn't have any uranium either. They got it from Merhaven. They were now doomed to start at the bottom of the economic ladder and work up, if they could. The commodities they had once depended on would bypass them completely. They had neither raw materials nor industrial technique, and they had had lived so long off the efforts of others that they had forgotten how to work. They would have to learn, the hard way.

Jason looked up to see Carlos scrambling out of bed. In spite of his commands she curled up in his arms and went to sleep.

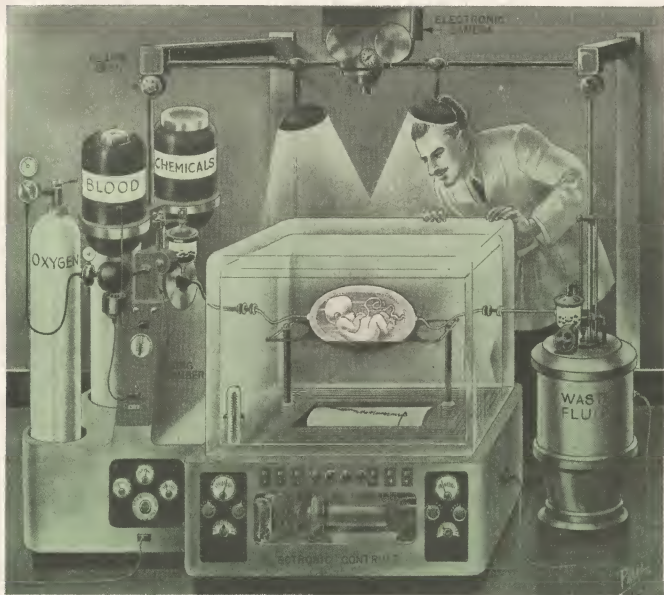
He held her and stroked the ridiculous fur that still covered her body. It was not really fur, now that he thought about it. For a long time it had reminded him of something else that he couldn't quite place. The silken, curly yellow strands caressed his fingers. With certainty he knew what it was—*Jason and the golden fleece*. +



the ELECTRONIC baby

*Birth without pregnancy, a baby nourished by the mother's blood
... her own child ... but minus the age-old travail of childbirth.*

by Dr. GREGO BANSHUCK



The Gagnon ectogenetic-electronic gestation apparatus. Here we see the child near birth.

IT was in the year 1944 that the historic experiment which was to rock the foundation of man's world actually took place. For the record, let me state this here, so as not to cause any misconceptions.

In that year, for the first time in medical history, human female eggs were fertilized *outside* the mother's body. This unprecedented feat in experimental biology was accomplished by Dr. John Rock and Dr. Miriam F. Menkin of the Harvard Medical School of Boston and the Fertility Clinic Laboratory, Free Hospital for Women, at Brookline, Mass. If you are still skept-

tical you may look up their article in *Science*, August 4, 1944 issue.*

It is true that no child was produced in this classic experiment. Indeed, the fertilization was a purely microscopic event—it never progressed beyond the two-cell division stage. The fertilized egg, not having a mother's womb and a continuous blood supply to nourish it, died on the microscope slide in short order. But a notable beginning had been made. More of this anon.

* Published by Science Press, Lancaster, Pa.

Before this historic event, man had succeeded in begetting human offspring by the method known as insemination. No longer was it necessary to perform the marital act in case the wife was, for mechanical reasons, unable to conceive. The husband's (or a donor's) live sperm, injected via syringe into the womb, frequently overcomes the wife's "sterility." A healthy child is the result. The modern practice, mistakenly called "test-tube babies," is widespread nowadays. Pick up any medical journal and read the latest report on insemination. At this late stage, it is unnecessary to add that insemination children are as healthy as those normally begotten.

Astounding Report

I come now to the astounding report of the French Canadian doctor, Professor Cyprien Gagnon of the Dominion Medical College of Trois-Rivières, Quebec. Gagnon, well known for his researches in human embryology, is the discoverer of the Proliferating Bilateral Chromosomes.* Long an experimental biologist, he has been repeatedly decorated, most recently by the French Government—the rare *Grand Ordre du Crépuscule en Biologie*.

I am now permitted to state that, on February 16, 1945, there was born in Professor Gagnon's laboratory in the city of Trois-Rivières at 6:05 p.m., the world's first living ectogenetic electronic baby. Born not from the travail of a living human mother, but from a lifeless glass tank. I myself saw this miracle human in 1946, then over 1½ years of age, a healthy, robust child.

As an old laboratory associate of the Professor, he has kindly permitted me to release the following facts, hitherto unpublished. Professor Gagnon reluctantly consented to this premature publication of his work only to forestall irresponsible stories in the daily press, because of a known leak through a student on the faculty.

Professor Gagnon had fertilized human female ova (eggs) for several years *in vitro* (on glass slides). He soon learned to keep them alive for days by nourishing the eggs with the mother's blood.

Gagnon then developed a new and simple method for obtaining actual ova from his wife. Up to then it had been a difficult feat to find human ova. Reason: they are exceedingly minute, many times smaller than the period at the end of this sentence. He first built an electronic ovulation detector. He found that when a woman ovulates once a month, the electric potential in the vicinity of the ovary suddenly changes. For that reason the detector—a small disk-like instrument—is strapped over the ovaries. A buzzer or light indicates when actual ovulation occurs. Gagnon then developed a new practical way to extract the live egg. He does not do this by abdominal surgery (the only means known heretofore), but by his *ovtractor*. No information can be released now about this instrument, because it is still in the patent stage.

The Bulbus

The egg is then placed in a special, soft, highly elastic container, called a *bulbus*. It is made of a rubberized new plastic, known as *transplax*. It is transparent and has a somewhat pink color. The bulbus is egg-shaped and is about as large as a duck's egg. At each end, the *transplax* is much thicker to allow the insertion of a threaded glass or plastic tube ¼ inch in diameter.

The human egg is introduced through one of the

two openings into the interior of the bulbus. Just prior to this, under the microscope, the egg is fertilized by the professor's own spermatozoön, his live sperm. Once the fertilized egg is in the *transplax* bulbus it immediately attaches itself to the soft, rubber-like inside wall, just as the egg attaches itself to the womb wall after normal conception.

(The description of the artificial gestation which follows is purposely sketchy, since the intricate technical description of the entire complex processes would be of interest only to medical technicians and embryologists.)

Once a human egg is fertilized it will grow in any suitable surrounding, as long as there is the requisite temperature to support life, and the necessary blood supply from which the growing fetus must secure its nutrition. Thus, fertilized eggs grow not only in the womb, but also in the Fallopian tubes, and in almost any site in the abdominal cavity. True, in the latter two cases, the pregnancy may not come to term, because, in the first, the tube bursts after a number of weeks, and, in the second, some of the woman's organs may become adversely affected. Usually an operation must be performed to save the mother's life. The embryo, too, dies, not because of lack of growth or insufficient nourishment, but for purely mechanical reasons due to the wrong placement and wrong environment.

Note also that, when in the correct environment—the womb—the fertilized egg will grow not only its embryo but also everything necessary to sustain its life up to the point of birth. That includes the placenta, or the afterbirth (organ of nutrition for the fetus), and the umbilical cord with its blood vessels, etc.

Contrary to popular opinion, embryologists point out that there is no direct connection, ever, between mother and embryo. There are no nerves nor blood vessels that pierce the placenta wall. Instead, the mother's blood and other nourishing fluids enter the placenta by the phenomenon known as *osmosis*, i.e. diffusion of fluids through thin membranes. If it were not for this circumstance the successful growth of a child outside its mother's body probably would be impossible.

Gagnon's Technique

We understand now that when the fertilized egg is placed in its rubber-like counterpart of the human womb—the bulbus—it has a good chance to survive and grow, which indeed it does, under the perfected Gagnon technique.

To the bulbus are attached next the two threaded tubes aforementioned. One of these carries the mother's blood, oxygen, etc.; the other carries the decarbonizer which helps eliminate the fetus' waste matter and several gases and fluids. These connecting tubes are attached to the proper tanks, electronic pumps, and a number of other electronic and recording instruments.

The bulbus with its fertilized egg is then placed into a closed glass tank, 2 feet long, 2 feet high, and 18 inches wide. This tank has double walls like a thermos bottle—and is filled with a special oil. Near the tank there is an electronic radiation heater which keeps the temperature of the oil and bulbus exactly at 98.6 degrees, day and night.

The mother has already donated a pint of her blood. This is first purified, and then placed into a specially constructed thermos flask. Connected to the flask are a number of glass pipes, one of which leads to the bulbus through an appropriate heater. The flask itself is continuously heated to the correct temperature. The blood is forced into the bulbus by means of a small electronic pump. The blood supply

* See his book: *Les Chromosomes Proliférés Bilatéraux*, Hachette & Cie, Paris, 1943.

must remain constant, increasing in quantity as the unborn child grows.

Mixed into the blood are certain necessary vitamins and chemicals, notably calcium. These extra ingredients keep changing as the artificial pregnancy proceeds, just as in normal pregnancy the chemistry of the mother's nutriment changes from month to month.

The mother donates a fresh pint of blood every three or four weeks, depending upon the growth of the embryo. *For this reason the child when born will be all her's exactly as if she had carried it within her own body.*

Birth Without Risks

The child will be healthier, will not be marred by forceps (as during difficult births), will not be injured by accidents to the mother, won't have its skull compressed (often with permanent damage) if the woman has too small a pelvis. Moreover, the mother won't have a pregnancy which can sometimes disable and invalidate her. *Also there is no painful labor.*

As we watch the bulbus week after week, we notice that it grows steadily larger in its synthetic pregnancy. Being made of a highly elastic material, it stretches easily until, at the end of the nine-month term, it will have attained the size of a medium-sized watermelon. Inside there will be the *chorion* (the outer envelope or membrane of the fetus. Inside the chorion is the fluid (popular name, "the water") in which the fetus floats. There is also the placenta with its cord. The total weight of the loaded bulbus now may be (in case of a single child) from 8 to 15 pounds; much more in case of twins or higher multiple births.

Since the first day of the embryo's life, the glass tank with its oil-submerged bulbus has rested upon a special cradle which at its ends has two steel beams. This comprises a most delicate electronic scale, and operates on the well-known electric condenser principle. An ink stylus continuously traces a recording line on a moving roll of paper. Thus, Dr. Gagnon knows the exact weight of the embryo or fetus at all times. But the professor goes further. Attached to the weight-recording stylus are several levers. If, during any 24 hours, the unborn child's weight increases or decreases unduly, the levers, through a complicated set of gears, will, by electronic means, increase or decrease the normal flow of nourishment. Thus, the embryo (or the fetus) is never overfed nor underfed.

Electronic Safeguards

After the fourth month, a set of elaborate electronic and other devices are switched on to safeguard the rapidly growing fetus. As we all know, this is the time when the unborn child begins to twist and move. Often the motions are violent. Untold times a child may be stillborn through having the umbilical cord wrapped around the neck, strangling it. This can't happen with Gagnon's method. Three different alarms are provided, which go into operation should the

fetus happen to move beyond a certain degree.

Finally, there is an automatic motion-picture machine near one end of the tank. It takes one picture every hour—24 a day—till the moment of birth. Thus, there is a complete motion-picture record of the entire gestation for the full nine months. When the child is old enough, *he will see himself grow from: nothing to his final birth*—a fascinating record to watch on the screen.

Now—the Actual Birth

Now for the actual birth. *This is the most prosaic phase of the entire process*—an anticlimax. It is too simple! It is also an assisted birth. Dr. Gagnon doesn't wait till the bulbus rips or bursts open, for the good reason that it is not living tissue and might last for many more months.

So, when the fetus has gone the full term—nine months—Gagnon simply stops all electronic apparatus and gadgets. Then the professor lifts off the glass top of the tank and with the help of his wife—who, as a mother, after all *should* assist in the birth of her own child—rapidly lifts out the bulbus. It is placed on a roll-table covered with a molded rubber sheet. With a blunt pair of surgical scissors he rapidly cuts both the bulbus and chorion envelopes. The light green birth fluid spills over the rubber sheet into a pail. The sheet is removed. Now the child is lifted free and fluids are drained from its mouth and nose. Next it is placed on the table covered with heavy heated towels and blankets. The professor now ties the umbilical cord of his son—(yes, it was a boy)—cuts the cord beyond the tie and dresses the stump.

The birth is over—astonishing in its utter simplicity.

Now for another wonder. Mrs. Gagnon actually will nurse her own child! How is this possible? A week before birth she had been given a series of special Estrogen-B1 injections. These have a powerful influence upon the mammary glands—lactation then results.

It is quite natural that at this point you ask: why does Gagnon wish to keep this epoch-making milestone in man's evolution secret?

Ectogenesis

The Church frowned on Professor Gagnon's early experiments. His ecclesiastical advisers exacted a promise from him that should a living child be born he would not attempt to create another one by *ectogenesis* (reproduction outside the body). He furthermore agreed that the Church would carefully watch the child for thirteen years after birth, till puberty, to make certain that the new revolutionary method would bring perfect children into the world.

For this reason, too, you will not hear anything further about the Gagnon family, nor his work, for several years to come. +

(Note: This article was first printed in Hugo Gernsback's annual Christmas booklet, *Digest of Digests*, December, 1946. © 1946, by H. Gernsback.)

THE BACK COVER

Not so long ago the fourth dimension, as imagined by scientists and mathematicians, was supposed to be a sort of hyperspace. In it, matter assumed strange and amazing properties. Thus you could open an orange by turning it inside out, without breaking its skin. Or you could remove a patient's appendix without making an incision.

It remained for Dr. Albert Einstein to change the entire philosophy of the extra dimension. He postu-

lated that the fourth dimension in fact is *Time*. Thus a human being—like other solids—has length, breadth, and width, but for every moment of his life, and even in death, he is also in another dimension, *Time*.

Our back cover shows this graphically, in a sur-realistic drawing by Paul and Tina. It shows that matter is continuously immersed in time. The planets, the stars, the entire universe as well, all have a fourth dimension—*Time*.

science news shorts

astronomy

Saturn's Size

SATURN, the mysterious, ringed planet in our heavens, is considerably larger than astronomers had believed. This planet with its rings and satellites, is 95.33 times as bulky as the Earth, according to latest calculations. Dr. Hans G. Hertz, of the U. S. Naval Observatory, recently explained these findings to members of the *American Astronomical Society* at a meeting at Amherst College Observatory. This latest value (the mass of the Saturn system is 1/3497.64 as great as that of the sun) is significantly higher than that of 1/3501.6 now in use. The new figure is based on observations, made from 1884 to 1948, of the path of Jupiter and of exactly how far Saturn pulled Jupiter out of an elliptical orbit around the sun.—*Science Service*.

Galactic Star Chains

GIGANTIC groups of stars, such as the Milky Way galaxy, have been found to be connected by chains or bridges of stars of length of ten thousand million miles. Dr. Fritz Zwicky, professor of astrophysics at the California Institute of Technology, has spotted a number of these stellar chains, which show on plates taken with the 48-inch Schmidt telescope on Mount Palomar, when these plates using strong contrast. The more important of the stellar highways thus far discovered are being photographed with the 200-inch Hale telescope. Dr. Zwicky reported his findings in the *Publications of the Astronomical Society of the Pacific*.—*Science Service*.

Merging Galaxies

AT A SPEED of thousands of miles per second, two giant galaxies have been passing through each other out in space! As the stars in the galaxies are separated by as great a distance as those observed in the Milky Way system, actual star collisions will most likely be rare. Astronomers of the Mount Wilson Observatory of the Carnegie Institution of Washington, D. C., have observed the two merging galaxies. The "crash" of the galaxies took place, in fact, several million years ago, for the light must travel vast distances to reach Earthly observers.

The space between the stars of such galaxies is not empty, but filled possibly with atoms of hydrogen (in the form of a tenuous dust). Enormous temperatures, produced by the clashing of gas particles between the stars, generate radio waves. The radio waves are picked up by sensitive receivers on Earth. The galaxies may finally merge and form a double galaxy, or they may simply pass completely through each other.—*The New York Times*.

Jupiter's New Moon

JUPITER'S newly discovered moon goes *backward* in its rotation about its planet. The new moon is Jupiter's twelfth satellite, and, contrary to the usual west-to-east direction followed by most celestial bodies in the solar system, it cruises around Jupiter from east to west. The new moon of Jupiter cannot be seen by amateur telescopes and is visible only on the photographic plates obtained with a giant telescope. Discovered by Dr. Seth B. Nicholson, astronomer of the Mount Wilson and Palomar observatories, the new satellite takes 700 days to complete a trip around Jupiter and measures only 14 miles around. Three of the other 12 moons of Jupiter also travel in a direction contrary to the usual stellar "rules of traffic." The Earth's moon follows the orthodox west-to-east direction. It is possible that these "wrong-way" travelers came from outer space, keeping their original direction of travel when they became satellites, in spite of the gravitational force of the huge heavenly body. The errant moons of Jupiter are believed to have been asteroids or minor planets, captured by the powerful gravitational pull of Jupiter. The orthodox moons were possibly born of Jupiter itself.—*The New York Times*.

New Facts About Asteroids

THE CHARACTERISTICS of the asteroids—our smallest planets—have puzzled astronomers for many years—particularly the variations in the light reflected by them and their speed of rotation. The results of light variations of asteroids, as recorded by the 82-inch reflector of the McDonald Observatory, in Texas were presented at a recent meeting of the *American Astronomical Society*, at Amherst, Mass. From these observations it is ascertained that the asteroids have irregular shapes, that they rotate quite rapidly, and that their densities are probably comparable with that of the moon (about $3\frac{1}{2}$ times the density of water). The observations were made by Dr. C. P. Kuiper and Daniel Harris of Yerkes Observatory of Chicago. The asteroids comprise thousands of small bodies revolving around the sun in orbits lying mostly between those of Mars and Jupiter. Their sizes range from diameters of a fraction of a mile to 500 miles.

Previous observations of the asteroids has been puzzling because of the apparently short rotation periods and the resultant high centrifugal force at the periphery. The period of rotation of *Leetitia* is actually 5 hours and 13 minutes, over twice the time originally suspected. The period of asteroid No. 15, *Eunomia*, was found to be 6 hours and 5 minutes, exactly twice that of the previous measurement. The periods of 5 to 7 hours are considered to be consistent with stability in the presence of rotation for bodies with a presumed density of $3\frac{1}{2}$ times that of water.—*The New York Times*.

astrophysics

The Weight of the Universe

TO MEASURE the weight of the universe Dr. Thornton Page, of Johns Hopkins University, observed star galaxies with the 82-inch reflecting telescope of McDonald Observatory in Texas. According to Dr. Page's findings, the weight of the universe has been estimated at too low a value. The universe weighs almost ten times as much as astronomers had previously estimated, the average galaxy of stars having a mass equal to 80 trillion suns. The average mass of double systems of spiral nebulae can be estimated by measuring their distance from each other, plus the speed of revolution of these gigantic groups of stars. Forty pairs of galaxies were studied by Dr. Page. The lightweight systems have approximately 5 trillion times the weight of our sun, while the heavy systems have an average weight of 150 trillion times the mass of the sun.—*Astrophysical Journal*.

Man-Made "Northern Lights"

ARTIFICIAL auroral displays have finally been made in the laboratory. Aden B. Meinel, assistant professor of astrophysics at Yerkes Observatory, University of Chicago, observed that hydrogen gas emitted from the sun reaches the Earth's atmosphere and causes the auroral displays. The ionized hydrogen atoms (protons) were estimated to enter the Earth's atmosphere at the tremendous speed of about $7\frac{1}{2}$ million miles per hour. In the laboratory a strong proton beam was provided by an atom-smasher (a kevatron) in the University of Chicago's Institute for Nuclear Studies. The kevatron yields a beam of particles with energies up to 600,000 electron volts. A beam of protons was shot through air (at lower than normal atmospheric pressure), and reproducing a spectacular aurora. The man-made aurora spectrum corresponded almost exactly with that of the natural aurora. From further studies with beams of pions and alpha particles, Meinel deduced that the natural aurora is probably produced by hydrogen, along with a small percentage of helium.—*The University of Chicago Reports*.

anthropology

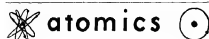
The First Americans

THE EARLIEST men in America apparently crossed over the Bering Straits at the onset of the third glacier, at which time a land bridge joined Siberia with Alaska, according to Dr. George F. Carter, archaeologist and geographer with Johns Hopkins University.

The men were provided with simple stone tools, some of which have been unearthed from gravel beds formed before the fourth and last glacier, over 100,000 years ago. Heretofore the age of man in the western hemisphere has been judged to lie between 10,000 and 20,000 years ago. Dr. Carter believes that the recent discoveries of early man-made tools in California may indicate that man invaded the western hemisphere as early as 400,000 years ago! Previously, Folsom man relics were thought to represent earliest man in America, dating the relics at about 20,000 years old; later dated at only 4,300 years old, according to the newer radio-carbon technique of evaluating old relics. By this method of dating, a pair of sandals, judged to be about 9,000 years old, was previously accepted as the earliest human relic found in America.—*Science Service.*

Bones of Oldest Man

THE EARLIEST MAN is described by Dr. J. T. Robinson, anthropologist of Transvaal Museum, Pretoria, South Africa, as having trod the earth many millions of years ago in Africa. A fragment of the bones of this most ancient "true man" has been unearthed about 25 miles northwest of Johannesburg, Africa, in the Swartkrans site of the Upper Pliocene age. The bone specimen consists of a well-preserved part of the nose, with part of the palate intact, the palate being deep like that of human. The socket for the left canine tooth is intact and is too small for even the smallest of ape-men teeth roots. The specimen is believed to be that of a very primitive euhominid (true man) and shows the close relationship between the African pre-man (australopithecines) and man. It is almost certainly the oldest true man so far known.—*Science Service.*



New Atomic Process

ONE OF THE most serious drawbacks to the realization of atomic power is the relatively low efficiency in transforming the uranium energy into electrical or another utilizable form. Sir John Cockcroft, director of Britain's atomic energy establishment, stated recently that an improved atomic reactor is being studied for the purpose of improving the efficiency of energy utilization. The new reactor has a small core enclosed in a pressure shell, a large boiler, so that the heat developed from the radioactive substance can be transferred to a steam generator by a gas under pressure. Sir John estimates that, if 60 percent of the uranium can be utilized to produce power, a mere 10 tons of uranium could supply the annual power requirements of the United Kingdom.—*The New York Times.*

New Breeder Reactor

ELECTRIC power of 250 kilowatts is being produced from a new type of breeder reactor, utilizing an atomic fuel-holding core about the size of a football. The heat of the atomic reaction is employed to generate steam to operate turbo-generators. From the small core, neutrons are shot forth which are absorbed by U-238 atoms in a blanket surrounding the core. This action produces

plutonium. The blanket containing natural uranium is suspended in a sodium-potassium alloy coolant contained in a tank. Neutrons are reflected back into the reactor by a shield surrounding the tank. The coolant itself is radioactive and therefore a heat-exchanger is used; from this device heat is transferred to a nonradioactive, sodium-potassium cooling system. This system, in turn, carries the heat developed to a second heat-exchanger, which transfers the heat to water, which then generates steam. The experimental breeder reactor is in operation at the National Reactor Testing Station near Arco, Idaho. Data obtained from this experimental breeder reactor should prove valuable to future designers of atomic-electric plants.—*Chemistry.*

A-Bomb-Proof Concrete

A NEW CONCRETE mixture, containing barite as an aggregate, is capable of shielding persons from the death-dealing rays of atomic bombs, according to the *Canadian Journal of Technology*. K. A. Sheldahl, V. E. Vaughan and E. L. Cameron, working at the Nova Scotia Technical College, discovered that a concrete made with a barite aggregate provides a density of 200 lb. per cubic foot, compared to a density of only 145 to 150 for ordinary concrete. A concrete mixture containing barite particles $\frac{3}{4}$ inch in size reduces gamma ray transmission considerably. A four-inch-thick barite-aggregate concrete passes only 25 percent of the gamma rays striking it. Less than five percent is transmitted through a wall 8 inches thick.—*Science Service.*



Airplane Crash Beacon Locator

A MYSTERIOUS code number flashed continuously for 48 hours by an automatic radio beacon may save many lives in the near future. The Air Force (U. S. Air Rescue Service Division) is developing an automatic crash beacon locator, which can be dropped by the pilot (or released automatically) when a plane must make a crash landing. A five-inch diameter cylinder about two feet long contains the radio beacon, the electronic parts being specially mounted to withstand the shock of a crash. It operates on land or water. The radio information picked up from the crash radio beacon by several remote direction-finding stations is channeled into a central station, where an expert locates on a map the exact spot where the plane landed. Rescue planes then focus their radio direction-finding on the beacon signals and fly directly toward the plane in distress. The beacon transmits the serial number of the plane and a code letter, which will enable the rescue teams to determine what plane crashed, the number of persons aboard, and the type of rescue equipment required.—*Science Service.*

Self-Starters For Jets

APERPLEXING problem in connection with jet-propelled airplanes has been how to start the turbo-jet engines, automatically. The solution appears to reside in a new tiny rocket-type engine, which the pilot can start electrically by simply pushing a button. The newest self-starter uses a liquid or a solid fuel. A British design employs propyl-nitrate

in a miniature gas turbine with a combustion chamber, a turbine, and a shaft. When ignited it provides power to drive the small turbine, which is geared to produce up to 10,000 r.p.m. on the shaft, which is sufficient to start the main jet engine. A newly developed American-type starter weighing only 75 pounds, and burning a mixture of high-pressure air and jet fuel, is now in production and is being installed on Sapphire jet engines, power-plant of the new Air Force F-84F fighter-bomber. A new General-Electric development in jet self-starters employs a solid fuel; the fast-burning solid, in a replaceable cartridge, is electrically ignited.—*Science News Letter.*



Cyanide Antidote

CYANIDE has remained until recently a very deadly drug. C. W. Mushett, K. L. Kelly, G. E. Boxer, and J. C. Richards, of the Merck chemical company, announced that vitamin B-12a is a (Vitamin B-12 itself is not effective). When vitamin B-12a was injected in mice that were apparently dead (showing no signs of breathing), they revived at once or soon thereafter, if the injection was given within four minutes after the potassium cyanide had been administered. If a longer time ensued after poisoning, the antidote was ineffective. If given before the cyanide is taken, the B-12a will act as a preventive against poisoning.—*Science Service.*

Human and Ape Blood Stains

STAINS made by human blood and those from apes, monkeys, and lemurs are so similar that no simple laboratory test will indicate which is which. This fact was revealed by Dr. R. B. H. Gradwohl, director of the St. Louis, Missouri, police laboratory, at a meeting of the *American Association for the Advancement of Science*. Chimpanzee blood gives a reaction identical with human blood when tested with anti-human precipitin, the standard test for blood identification. Human blood, furthermore, reacts in the same way as chimpanzee blood when tested with anti-chimpanzee precipitin. These results agree with tests on blood made by Dr. J. E. Duncan-Taylor of Capetown, South Africa. Dr. Gradwohl warned against appearing in court and making statements as to the identity of certain blood stains, for the precipitin-reaction tests might lead them astray and later evidence might make it impossible to support their findings.—*Science Service.*



Plants—Uranium Locator

A CLUE to the presence of valuable uranium and vanadium ore deposits is given by studying the kinds of plants growing in a region. Also analysis of the plant's leaves will reveal whether the plant has grown in soil heavily surcharged by uranium or vanadium. The research, by Dr. Helen L. Cannon, was

part of a survey conducted by the Atomic Energy Commission.

Among the plants which may indicate the presence of these valuable ores are rabbitbrush, shadscale, mormon tea, milkvetch, and grasses. Other indicators are junipers, scrub oak, and cliffrose. With too much uranium, the plants become sick. The roots of the plants absorb uranium and vanadium, which spread through the plants to the twigs and leaves, and which may be detected by chemical analysis. In the leaves where the plants have grown in ore-enriched soil, the ratio of uranium detected may be as much as 100 times greater than for leaves of plants grown in soil containing no uranium.—*Science News Letter*.

I communication

1,800 Conversations on One Cable

THE BELL TELEPHONE Laboratories have completed a new coaxial cable which would make it possible for 3,600 people to carry on telephone conversations between New York and Philadelphia. This new coaxial cable is capable of transmitting 600 telephone conversations and a television program each way. The system is known as the L-3 and is made up of two coaxial tubes passing through the center of a cable. Special filters and other equipment keep the telephone talk and television programs separated. New types of amplifiers were designed for the L-3 coaxial cable and twice as many are required per unit of length as compared to the old coaxial lines. The L-3 cable will be the first to carry telephone conversations mixed with television programs.—*Science Service*.

electronics

Electronic Ear

A TELEPHONIC device that reacts to the spoken voice has recently been discovered by the Bell Telephone Laboratories. The device (named "Audrey") will respond to any of ten spoken numbers from "1" through "10". In its present form the device responds by flashing an appropriate light, but it could be made to perform other operations, such as operating dialing mechanisms. It is possible that Audrey's vocabulary will be extended to other sounds. The device listens to the human voice, then sorts out the speech sounds into electrical categories which conform in their own medium to certain sound-wave patterns. These categories are analyzed by matching against a memory cell, containing standard reference patterns already drawn electronically. When the standard pattern which best matches the electrical pattern of the spoken number is found, the appropriate light flashes on. Audrey responds best to the particular voice to which it is carefully adjusted; it will not answer reliably to a variety of talkers, unless the apparatus is adjusted for each one. The device will not register careless enunciations or accents.

Audrey was described in the *Journal of the Acoustical Society of America* by

K. H. Davis, R. Biddulph, and S. Balashek, of the Bell Telephone Laboratories, who have developed its intricate details. The experimental equipment for Audrey occupies a space only about the size of a large TV-radio-phonograph console.

Tri-Color TV Tube

A NEWLY DESIGNED tri-color television picture tube was recently demonstrated in New York City by the Chromatic Television Laboratories, Inc. It is claimed that the new tube for reproducing TV images in their natural colors can be manufactured more cheaply than other similar types. At the demonstration, the tube reproduced the colors faithfully on an 18-inch screen in a fully-lighted room. The new color TV tube was developed by Ernest O. Lawrence, director of the radiation laboratory of the University of California. Reception of color images on a black-and-white set of current vintage would require a converter, plus the new color tube, and a reconnection of circuits involving about three tubes.—*New York Herald Tribune*.

TV and Power in a Single Tube

A THICK copper tube, forming a waveguide, is being experimented with by engineers in an effort to make it serve simultaneously for the transmission of telecommunication waves and electrical power on the same wire line. It was found in experiments at University College (London) that some 800 kilowatts of peak power could be transmitted at a frequency of 3,000 megacycles along the outside of a single, bare copper wire. Prof. Harold M. Barlow (of University College) has now substituted a hollow copper tube for the solid wire. He sent waves oscillating up and down the outside of the tube and found that they could be employed to sustain the surface wave, while the body of the copper tube served to transmit an electric lighting current. The inside of the tube simultaneously served as a guide for microwaves. In this fashion a triple service was provided by the single copper tube. Similar experiments are being carried on by the U.S. Signal Corps Laboratories at Fort Monmouth, N. J.—*The New York Times*.

Ultrasonic Whale-Finder

A NEW whale-locator employs ultrasonic echoes operating on the same principle as the sound-echo devices used to track shoals of fish. The ultrasonic whale-finder can locate the giant monster of the deep at distances as great as 2,000 yards (6,000 feet, or over a mile). Whale hunters can track the whale continuously by the sound echoes while they steal up on him preparatory to launching a harpoon (about 20 yards range). Eleven whaling ships now have this new device.—*Discovery*.

food chemistry

New Seaweed Food

SEAWEED and algae are reported being used as supplemental diet in Japan. Microscopic alga of the sea (*Chlorella*), that eventually may help to feed a hungry world, was discussed in the annual report of the Carnegie

Institution of Washington, D. C., issued by the president of the institution, Dr. Vannevar Bush. *Chlorella* is rich in protein, but its economical production may require some time for development. A pilot plant, however, has been built at Cambridge, Mass. In experimental production, the microscopic plant resembles a green liquid; the green alga, *chlorella*, is capable of producing 56 percent dry weight of protein (the finely powdered residue of dehydration). The excellent protein value of the alga is evident by comparison with the 15 percent dry weight of protein realized from alfalfa and the 12 percent from hay.—*The New York Times*.

geology

Origin of Craters

ACCORDING to Dr. F. C. Leonard, a meteorite expert of the University of California, several craters and depressions previously thought to have been caused by meteorite action are considered to be the result of terrestrial factors.

Crater Elegante, in Sonora, New Mexico, appears undoubtedly to be the result of collapse of the central portion of a volcano. In addition, evidence uncovered by Dr. L. la Paz and Dr. P. W. Healy of the University of New Mexico supports the theory that *Chubb Crater* of Quebec, Canada, was also formed by action other than meteoric. Among the factors taken into consideration for this assumption is the fact that the structure of the crater is different from those with known meteoric origin. In addition, no traces of meteorite material have been found. Supporting a hypothesis advanced by the late Dr. D. Johnson of Columbia University, Dr. Leonard concludes that the *Carolina Bays*, thought to have been the result of meteorite showers, appear to have been the result of a combination of factors of Earthly origin. Among these factors he includes the action of solutions, natural artesian wells, and the action of lakes and winds.—*University of California Clip Sheet*.

meteorology

Ice Crystals in Clouds Located by Radar

ICE CRYSTALS in high-altitude clouds can now be located by cross-polarization of radar waves. This new discovery is valuable, as these ice crystals are important in the formation of rain. The polarization plane for reception is arranged to be perpendicular to that used for transmission of the radar signals, as described in *Nature* (London), by Ian C. Browne of the Cavendish Laboratory, Cambridge, and N. P. Robinson of the Telecommunications Research Establishment, Great Malvern, Worcs. The new radar research may lead to a clearer conception of just how an ordinary cloud transforms itself into one capable of producing rain or snow. Not only does this new application of radar waves make it possible to detect the presence of ice in clouds, but also radar observers may be able to determine the shape of small quantities of ice in the clouds.—*Science Service*.

Cloud Seeding

MUCH controversy has arisen over the efficacy of seeding clouds with silver iodide crystals for rain production. Tests in New Mexico, along with experiments in ground seeding, promise extensive artificial weather control in the future. Economic, political, and military changes as a result of such a program would be considerable. As floods and droughts result from an extended excess or lack of rainfall, control of any sort would help. Although the problems of cloud seeding in drought areas are extreme, weather control may nevertheless be achieved in such areas, by large-scale seeding at distant points.—*General Electric Review*.

Oceanography

Ocean Level

THE general level of the oceans of the earth has risen 5 inches since 1895 (57 years). The melting of polar ice is a major cause of the rise in the oceans' level, according to Dr. George F. Carter, chairman of the geography department of Johns Hopkins University, in a report to the Office of Naval Research. Estimates show that the coast line of the continents would be radically changed if all of the polar ice should melt, for the level of the oceans would become about 100 feet higher than they are now. In the past 12,000 to 25,000 years the sea level has risen appreciably but not steadily. It is therefore difficult to predict when and if the total polar ice will melt. No sudden change in sea level is anticipated. However it would be advisable for harbor designers to figure on a rise of about 24 inches in sea-level in the next hundred years.—*Science Service*.

physics

Wandering North Pole

THE North Pole of the earth has shifted 12 feet in 30 years, much to the perplexity of scientists. Dr. E. H. Vestine of the Department of Terrestrial Magnetism of the Carnegie Institution in Washington, D. C., has found the answer for this conundrum. After studying closely the Earth's magnetic field, Dr. Vestine believes that the field has been drifting steadily westward, and further, that there is a corresponding westward movement of the upper layer of the Earth's liquid core, which accounts for the shift. Dr. Vestine also discovered that, besides this large westward drift, there are also smaller crosswise drifts of the liquid core that exert a force on the Earth's axis.—*Science Service*.

Cosmic Ray Threat to Pilots

PILOTS flying at high altitudes in such planes as the Navy's experimental types, are liable to injury from cosmic rays, in the opinion of Dr. Hermann J. Schaefer, director of a Navy project unit performing research on high altitude flying, at Pensacola, Florida. When a pilot reaches altitudes of 70,000 to 80,000 ft., where he is subject to cosmic ray ex-

posure for long periods, there is a possibility of physical injury. Dr. Schaefer stated that the dangerous high-altitude particles become weaker as they approach the Earth's surface, as they split up into smaller particles. One of the problems being studied is the length of time a pilot can safely fly at the higher altitudes. The delicate reproductive organs and the bone marrow might be damaged by a single heavy particle striking and passing through the body; however, some experts believe that a pilot can withstand the first hour of exposure without serious injury to the tissues of the body. At 70,000 ft. altitude the density of the cosmic ray particles is about 200 times greater than at sea-level, but the danger from the rays lies in the fact that their energy at high altitudes is concentrated in a small number of scattered particles. Heavy particles are found in greater profusion near the North and South Poles, owing to the Earth's magnetic field, and dwindle off to almost zero in the vicinity of the equator. Thus, the pilot flying at high altitude in a north or south direction away from the equator is faced with increasing danger from the cosmic rays.—*New York Herald Tribune*.

The Helium Cryostat

CRYOGENICS, or low-temperature physics, is made possible by the helium cryostat. They cost \$23,700, and over 50 units have been made and sold. Until 1946, liquid helium was little known, but about that time a professor of mechanical engineering at Massachusetts Institute of Technology, Samuel C. Collins, built a cryostat, in which he could efficiently produce helium. Temperatures to within 2° Kelvin (absolute temperature; water freezes at 273° Kelvin), were produced with the apparatus.

Many new and strange properties of matter at extremely low temperatures were discovered. Oxygen, for example, may become magnetic. If liquid helium is subjected to a temperature below 219° Kelvin, part of the liquid helium I converts into helium II. If helium II is placed in an uncovered container, the substance will climb the walls of the vessel and proceed over the top.—*Fortune*.

spatialogy

Escape in Space

IF A space flyer were to have an accident, he would have practically no chance of escape. According to an eminent expert, Dr. Fritz Haber, Department of Space Medicine of the Air Force School of Aviation Medicine, Dr. Haber, in a talk before a meeting of the American Society of Mechanical Engineers in New York City, said that a puncture in the hull of the ship would cause an explosive decomposition of the artificial atmosphere on the ship. The men would be sucked into space along with the escaping air. Even if the men survived the decompression and were wearing pressurized and insulated space suits, they would have slight chance of remaining alive. As they near the Earth, gravity would pull them toward the Earth at increasing velocity; if they fall from 60 miles altitude they would attain a maximum velocity of about 500 miles per hour. Their bodies would strike the Earth's atmosphere with severe impact,

and the atmospheric friction would develop tremendous heat (even as high as 36,000 degrees Fahrenheit), which would burn instantaneously the space suits and bodies.—*The New York Times*.

zoology

Porpoise Navigation

IT is possible that the porpoise has employed sonar (navigation by reflected sounds) several million years before man discovered it, according to Dr. W. N. Kellogg, animal psychologist at the Oceanographic Institute of Florida State University. In man-made sonar, high-frequency sound waves are radiated, and when they strike an object they are reflected. If two or more echoes or reflected sound waves are carefully checked for direction, the location of the intervening object can be accurately spotted. This the porpoise apparently does with the aid of natural sound-propagating organs Nature supplied him with. The sounds emitted by the porpoise (two of those classified) are whistles and clicks. They occur almost continuously, and either the whistles or the clicks could be used as sonar by the porpoise to locate objects ahead, such as a log or the hull of a boat.

The pitch of the porpoise's whistle changes constantly, thus avoiding any confusion that might be caused by the reception of reflected sounds of the pitch of those being emitted at the same instant. Otherwise the sound would have to be emitted in short, intermittent blasts, leaving blank periods in between for the reception of echo sounds. The clicking sound varies from five to several hundred per second. Some of the sound-wave frequencies are above the audible range of the human ear.

A single click can travel to and return from an object 2½ feet from the source in one thousandth of a second. If a porpoise does use reflected sound waves to warn him of objects in his path, as seems plausible, he could detect a submerged log in the dark only 2½ feet ahead and have time to turn aside and avoid striking the object.

Captive porpoises have demonstrated that they can hear ultrasonic sounds. According to Dr. Kellogg, further tests are to be made with blindfolded porpoises to ascertain whether they can avoid objects in the water. If they can, then they undoubtedly employ sonar or reflected sound waves to guide them on their way.—*Science Service*.

Plant-Animal Creatures

HALF-ANIMAL, half-vegetable organisms—phytoflagellates—utilize photosynthesis to supply their nutritional needs, as do higher plants. They ingest particular matter in the same fashion of higher animals, but absorb the dissolved materials in a combined plant and animal way. This study by Dr. George Holz, of the Department of Zoology, University of California, was made on the acetate flagellates, which seem to prefer acetic acid as an energy source. The organisms of this group are unable to utilize glucose, a universal source of energy. On the other hand, they are able to thrive in strong concentrations of fatty acids, alcohol, and many other media characterized by acidity and alkalinity.—*Science Service*.



book reviews



The Science-Fiction Method

MODERN SCIENCE FICTION, Edited by Reginald Bretnor, Coward-McCann, N. Y., 1953. 294 pages. \$3.75.

THIS VOLUME is a symposium, composed of eleven essays, which attempts to interpret the meaning and future of modern science-fiction. According to the inference of several of the essays, the term "modern" in this volume would appear to apply to the time from Hugo Gernsback's introduction of his particular brand of science-fiction to the American public, up to the present.

Among those contributing to this symposium are such well-known names as Philip Wylie, Gerald Heard, Arthur C. Clarke, Fletcher Pratt, John W. Campbell, Jr., L. Sprague de Camp, Anthony Boucher, and Isaac Asimov. Probably the most interesting of the group is Anthony Boucher's *The Publishing of Science Fiction*. Unfortunately, Mr. Boucher has made the mistake of being too specific in detail, and his essay is marred by errors and questionable inferences.

The most courageous and admirable essay originates from the typewriter of the editor, Reginald Bretnor, and is titled *The Future of Science Fiction*. Though burdened by over-involved reasoning, Bretnor's conclusions are thought-provoking. Bretnor feels that the popularity of science-fiction lies in the fact that it is the first field to adapt the scientific method to literature, and hence may revo-

lutionize the entire field of literature.

The volume, within its self-imposed limitations is enjoyable and worthwhile, and its editor is to be highly commended.

Space Medicine

PHYSICS AND MEDICINE OF THE UPPER ATMOSPHERE, Edited by Clayton S. White, M.D., and Otis O. Benson, Jr. The University of New Mexico Press, Albuquerque, 1952. 611 pages. \$10.00.

THIS MONUMENTAL VOLUME is subtitled *A Study of the AEROPAUSE*, and Aeropause is defined as meaning: "a functional border region between space and the atmosphere of the earth." The entire volume is composed of the proceedings of a symposium on the physics and medicine of the upper atmosphere held at San Antonio, Texas, November 6, 7, 8, 9, 1951, and sponsored by THE AIR UNIVERSITY SCHOOL OF AVIATION MEDICINE, Randolph Field, Texas.

Were the entire space of this month's book review column devoted to this book, it could scarcely do more than itemize the 42 semi-technical articles, covering what appears to be virtually every aspect of the problems to be encountered by man's initial sally into space. Fritz Haber, Heinz Haber, Fred L. Whipple, Werner, von Braun, H. J. Muller, J. Kaplan, Konrad Baettner, and William W. Kellogg are only a few of

the illustrious names that decorate the distinguished contents page of this book. A scientific education is desirable for its complete understanding, but it takes no special ability to ascertain that it is the basic book on the initial problems of space flight published to date.

The Poor Fan's Anthology

STAR SCIENCE FICTION STORIES, edited by Frederik Pohl. Ballantine Books, N. Y., 1953. 256 pages. Cloth-bound, \$1.50, paper-bound, \$3.5.

WE HAVE HERE AN ENTIRELY NEW experiment in science-fiction publishing. Frederik Pohl has edited, and Ballantine Books has published, a collection of fifteen stories, all of them brand new, written especially for this volume. The book is published simultaneously as a clothbound volume and as a newsstand-circulated pocket-book.

A good many of the stories in this science-fiction collection are very strong, and the authors could scarcely be more illustrious comprising Arthur C. Clarke, Murray Leinster, Henry Kuttner, C. L. Moore, Robert Sheekley, Isaac Asimov, Ray Bradbury, Judith Merril, H. L. Gold, William Tenn, John Wyndham, Clifford D. Simak, Fritz Leiber, Lester Del Rey, C. M. Kornbluth and William Morrison.

It is difficult to see how the potential purchaser could go wrong, regardless of whether he purchased the "expensive" or the popular priced edition. +

Science Questions and Answers

Error

Editor,
Since when does light travel at 186,000 miles an hour, as you have it on page 38 of your March issue? Is this Science?

A. P. Marsh

Staten Island, N. Y.

Answer:

Mr. Marsh and several dozen other readers spotted this obvious misprint—inexcusable in a magazine that sports the word *Science* in its masthead.

Our manuscript and proofsheet read correctly 186,000 miles a second, but our unsentimental printer in resetting the article changed second to hour without showing us the corrected proof. We are happy that our readers watch us so closely—it puts us on our toes!

—Editor.

Risience & Schuss-Yucca

Editor,

I looked up the word *Risience* in three big dictionaries, including a recent *Webster's New International Dictionary*, second edition. No such word could I find. Then I read and reread Dr. Gustav Albrecht's story, "Rapid Wonder Plants"

several times before it dawned on me that the whole thing was a hoax. I then showed it to a science professor friend who swallowed it hook, line and sinker. Thereafter I had a lot of fun with it with other master minds of science—most of them falling for the nonsense, too. But what I, and presumably other readers, want to know: *How long did it actually take to photograph that Schuss-Yucca plant?*

Elmer S. Price
Freehold, N. J.

Answer:

To warn our alert readers, your editor coined a new word, *Risience*. The word was prominently flagged at the beginning of the article. As yet, it cannot be found in any dictionary. The word has its root in risible: droll, laughable; risibility: ability to laugh. Hence *Risience* means laughable science.

Those readers who are linguists noted Dr. Albrecht's mention of the German publishing firm: *Schmutzig-Verlag*. In German, *Schmutzig* means dirty—a giveaway of the non-seriousness of the article. In your editor's letter to the staid and normally very serious publication, the *Scientific Monthly*, he joined in the fun

by rechristening the German firm: *Schmutzig & Dreckig Verlag*. This means *Dirty & Filthy Publishers* (See page 41, *SCIENCE-FICTION* + March, 1953). Not satisfied, he named his famed French scientists Lablague and Gaillard. The former means the *bunkum*, the latter *ribald*.

As for the famous five photos, the giveaway was the various different shadows. If you look closely, you will note that they all vary considerably. Therefore, the pictures could not have been taken seconds apart! While admittedly the Yucca plant grows very fast, it doesn't grow that fast! In actuality, the photos were taken a week apart from each other—still a remarkable botanical performance. The "model" was Dr. Albrecht's wife.

Your professor friend is in good company—other scientists were taken in as completely as your friend. Several science editors on large metropolitan newspapers were caught, too, and printed the item "straight"—as news. Even a staid British science magazine reported the now famed *Schuss-Yucca* as a scientific wonder.

The moral? Don't overtrust the printed word—even when backed up by excellent photographs!

—Editor.

AUSTRIA FILMS THE FUTURE

A new Austrian satirical movie deals with politics in 2,000 A.D. The Austrian declaration of freedom of 55 years of occupied "liberation," is an act of aggression, according to the World's High Court of Justice. A seven-member Commission lands in a cosmic gondola by Schoenbrunn Castle, where the government offices are located. Allied military police stand guard as the gondola lands, settling objections by judicious use of death rays. (The film was shot at Schoenbrunn Castle.—*Editor.*)

UNITED PRESS



THE WORLD AT BAY

One of science-fiction's basic themes—Earth's imminent doom—is excitingly pictured in **THE MAGNETIC MONSTER**, the new scientific film by Curt Siodmak and Ivan Tors. (Siodmak will be remembered for *Floating Platform No. 1*, *Transatlantic Tunnel* and *Donovan's Brain*.)

In the picture, Dr. Denker—one of the last lone wolves of scientific experiment—creates artificial element #116 (solonium), a hungry metal which must be fed increasingly large charges of electricity every eleven hours or it implodes, magnetizing all metallic objects around it in the process.

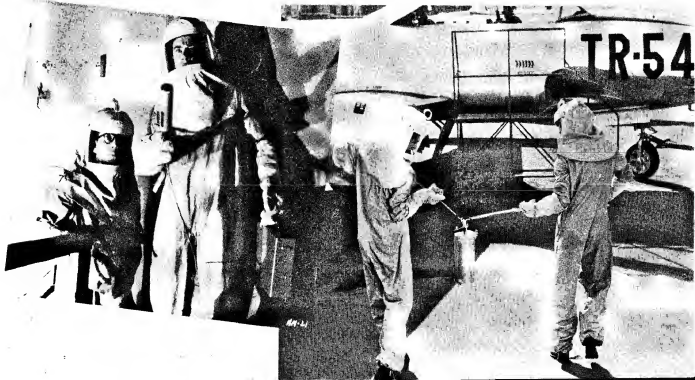
As the metal monster grows and grows, the time comes when all Los Angeles has to be blacked out in order for its dynamos to feed the solonium's insatiable appetite.

All the power of Boulder Dam will be forfeit at the next feeding time of the "World Eater"!

After that—how long left?

The climax is one of the greatest eye-and-ear spectacles in the history of scientific films. A. E. van Vogt, sitting next to me at the preview, called it "a triumph of tension."

By FORREST J ACKERMAN





"TIME IS THE
FOURTH DIMENSION"
Albert Einstein

Handwritten signature:
Lund
Pohl